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Personal Fableness and Perception of Risk Behaviors among Adolescents

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ABSTRACT

Adolescence is a crucial period where one tends to identify who they are as an individual. However, as a teenager is struggling to find his/her place in this world, it is also a time where they are prone to engaging in risk behaviors, which tend to have an extreme psychological impact. The objective was to explore the experiences of an adolescent who engages in risk behaviors and to understand their level of personal fables. The study was a qualitative design with content analysis with semi-structured interviews of ten male adolescents aged 16-18 years. The major findings of the study indicated that adolescent’s pattern of thinking revolves around the fact that they are invincible and invulnerable. Furthermore, adolescents are aware of the risks they are putting themselves through and how in the process they are hurting others. The implications of the study are to conduct more life skill programs in schools; greater awareness has to be created on the impact and harmful effects of such behaviors.

Keywords: Adolescents, risk behaviors, perceptions.

INTRODUCTION

“This will never happen to me” is perhaps the most prevalent response from the majority of adolescent’s when cautioned about consequences of risky behaviors. Adolescence is a period in one’s life where they are recalcitrant to accepting criticism and advice from adults outside their peer group. Most adolescents widely ignore the risks and engage in unsafe behaviors. Empirical findings suggest adolescents’ affiliation with friends who engage in risky behavior is a strong predictor of adolescents’ health-risk behavior, at least for substance use and violent behaviors¹⁷, ¹⁴. Adolescents perceive themselves as invincible/invulnerable to their actions that might have negative consequences. This thinking to what Elkind rightly defined as Personal fableness is “an adolescent’s intense focus on himself or herself as the center of attention is what ultimately gives rise to the belief that one is unique, and in turn, this may give rise to feelings of invulnerability.” Research evidence shows that personal fable levels are high during adolescence and with the association to engaging in risk behaviors¹, ⁷. Adolescents

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External factors, such as environment, culture, religion, school and the media influence the youth. Statistics relating to adolescent engagement in risky behaviors indicate adolescents drive faster than adults³, have the highest rates of sexually transmitted diseases¹², the highest rates of self-reported drug use, and commit the vast majority of crimes², ³. Risk factors adolescents engage in include individual factors such as low self-esteem, negative peer groups, low school engagement or pursuit of higher educational aspirations⁴. The familial risk factors include poor child-parent communication, low parental monitoring, lack of family support and parents themselves engaging in risk behaviors¹⁴.

Adolescents perceive themselves as invincible/invulnerable to their actions that might have negative consequences. This thinking to what Elkind rightly defined as Personal fableness is “an adolescent’s intense focus on himself or herself as the center of attention is what ultimately gives rise to the belief that one is unique, and in turn, this may give rise to feelings of invulnerability.” Research evidence shows that personal fable levels are high during adolescence and with the association to engaging in risk behaviors¹, ⁷. Adolescents
engage in risk behaviors under the notion that nothing can ever happen to them.

Culture plays an imperative role in behavioral patterns, which needs greater empirical attention. For instance: feeling that one is uniquely different from others (personal fable ideation) may be more characteristic of youth in Western societies, where individualism is typically valued and fostered. Studying this phenomenon from a collectivistic society to understand the risk related behaviors are important. In the fast growing pace of the 21st century, it is evident that the availability of drugs is easily accessible in a collectivist society.

The present study aimed to understand the subjective reasoning and differences amongst individuals that lie behind why an adolescent engages in certain behaviors, in spite of knowing their consequences, not attributing it to any theoretical concepts or personality characteristics. Studying this phenomenon from a collectivistic (Indian) society to understand the risk related behaviors are important. The focus has only been on certain risk behavioral characteristics, not taking a cluster of interrelated behaviors into account. This study gave participants an opportunity to talk about their experiences. Exploration of their experiences will allow health workers to introduce better support programs.

Research questions:

What is an adolescent’s perception of risk behaviour?

What are the factors that influence an adolescent’s perception of risk behaviour?

METHOD

The research design is a qualitative using content analysis method for data analysis. The sampling method included convenience and purposive sampling. The sample size consisted of ten male adolescent participants between the age group of 16-18 years of educated high school adolescents, engaging in risk behaviors residing in Bangalore.

Research Tools

Semi-structured interviews were conducted, as it enabled rapport building, allowed greater flexibility in coverage and probing of novel areas and produced richer data, unlike self-report questionnaires. The demographic data, screening tools Adolescent Risk Behavior Questionnaire (ARQ) and the New Personal Fable Scale was administered to identify potential participants. Ten boys who were engaged in risk behaviours of more than three on the Adolescent Risk Behavior Questionnaire were selected as participants.

Semi-structured interview Schedule was developed to conduct the interviews. The interview revolved around 15 risk behaviors identified with the help various literature reviews. The interview contained ten questions that were developed to elicit the client’s subjective perceptions of having engaged in various risk behaviors.

Data Collection and Analysis: Informed consent and permission to conduct the interview were obtained from the school authorities and students. The demographic data and tools were administered in the first phase followed by the interview in the final meeting. The researcher audio recorded the interview and parallel maintained a reflective journal for memo writing. The researcher recorded the impressions of the interview, the interviewee, duration, and atmosphere of the interview. The participants were thanked for their participation in the study and informed the results would be shared with them later on.

Content analysis was used to analyze the data collected. The researcher transcribed and read each transcript multiple times while simultaneously listening to the respective audio recording to rectify any redundancy or discrepancy. The common themes that emerged after the analysis of all the interviews were discussed in detail along with examples in the form of verbatim responses given by the participants.

Ethical Considerations: The informed consent and voluntary participation was ensured. Participants were made to understand there would be no monetary or any form of reward involved. The option of withdrawing from the study whenever they chose was kept open. The data was used only for research purpose. The study did not have any psychological or physiological harm to the subjects. In case of any psychological distress, relevant help was suggested to be obtained by the school counselor. The Department review committee granted the University ethical clearance for student research.
RESULTS

From the findings of the current study, it can be inferred that adolescents do understand the consequences of risk-taking behaviors. However, they do not seem to integrate their perceptions, to the decision-making process while engaging in such risk behaviors. Adolescents are embodied in nearly every type of risk-taking behavior. Copious human and financial resources are ardent each year to burgeoning programs that target adolescent risk behavior. Below are the themes, generated from the interviews of the ten participants.

Defining Characteristic of an adolescent: When the participants were asked about their most defining characteristic that makes them different from other individuals, the majority of the responses revolved around how they are willing to take risks/challenges. Many of them feel they have a high sense of willpower enabling them to be more daring, willing to take risks compared to other people they know. About participants feeling, they are more willing to take risks than others; there is a sense of positivity/negativity to their characteristics.

“I’m always willing to take risks; I enjoy hanging out with people who don’t go to college or school....., I love riding my bike fast once I’m stoned or drunk, I feel I’m always under control” – A 16-year-old adolescent

Peer pressure: Majority of the participants stated that it’s not okay to give into peer pressure. The most common reasons being the social circle they are part of engaging in risk behaviors such as smoking marijuana, cigarettes, and consumption of alcohol. Participants state, initially they have just tried it because their friends were doing so, they were curious and wanted to try it out too, despite knowing their friends shouldn’t influence them.

“No you shouldn’t give into peer pressure but, I had given in when I first started smoking pot, I felt bad initially, then soon it’s you who is peer pressuring someone else to do something.” - An 18-year-old adolescent

Influence of media: The modes of media such as television shows/movies, the majority of the participants stated these mediums influenced them, by seeing famous movie actor’s smoke cigarettes/ marijuana and consume alcohol. Furthermore, some participants stated the media has also influenced them in playing pranks such as peeing on a police car or school wall, bursting firecrackers at their principal’s office, rash driving and of alcohol. Six participants stated that media had influenced them.

“I first thought it was wrong but as friends were doing it, along with media and everything else I thought it’s okay its cool for sometime.” - An 18-year-old male adolescent

Self-perception and reasons to engage risk behaviors: Participants who engage in risk behaviors feel a high level of guilt, knowing they’re doing something risky/harmful, continuing to engage in such behaviors. Adolescents feel guilty that the allowances they receive from their parents are used for buying substances. One participant feels wrong from a religious perspective to engage in risk behaviors. He rationalizes his behavior by stating, he knows it’s wrong at the end of the day life gets tough and engaging in risk behaviors helps him escape it all.

However, four out of the ten participants don’t feel guilty in engaging in risk behaviors, stating they aren’t harming anyone, as they do it in safe environments. Their friends mostly have the particular substance, which they use. Thus they aren’t using their parent’s money at all. Six out of the ten participants; stated that they do feel bad and guilty in engaging in risk behaviors. However, continuing to do so because as it is a pleasurable act for them. They have lots of fun, knowing their limits and having control over their usage.

“I feel better when I’m using, I know I’m letting some people down, but I think it’s going to be fun for me, I’m always around friends when I do it, so it’s fine for me.”- An 18-year-old male adolescent

Adolescents are aware of the negative consequences engaging in risk behaviors. However, they justify themselves, by stating they don’t feel guilty about doing something wrong. Expressing they aren’t doing harder drugs such as cocaine. Some adolescents state as long as it’s just consuming alcohol, smoking marijuana and cigarettes they aren’t doing something harmful. Sensation seeking and identity explorations are growth-related characteristics, emboldening adolescents to engage in risky behaviors. On the other hand, in the majority of interactions, adolescents tend to not consider risky behaviors as really risky. Nine out of ten participants stated that risky tasks are enjoyable for them, relieve them from stress, make them more calm/
relaxed, allays them from family issues, schoolwork, self-satisfaction, thrill and excitement to test their limits.

“It gives you another world you can experience, when I smoke up I feel more relaxed when stressed with family or studies, it makes me calmer.” – A 16-year-old male adolescent

Peer pressure and media influence play a significant role, in risk behavior’s among adolescents. Results of the study indicated peer influence plays an imperative role explaining risky behavior during adolescence. In the present study, the majority of the participants believed they were mentally strong, have somehow been victims of peer pressure. Research has validated peer pressure and its relevance to social status among adolescents. Elkind’s (1976) concept of personal fable can be seen, in the present study. The way adolescents perceive themselves compared to others when interviewed on this domain. Personal fable gives rise to a sense of invulnerability and specialty with a propensity for behavioral risk-taking. Findings from this study corroborate to what Elkind (1967) suggests. Results of the current study can also be exhibited in other research studies/literature review acquiring similar results. Longitudinal, experimental and cross-sectional studies, postulate robust evidence that, youth are more vulnerable to view smoking favorably and to become smokers; as a result of exposure to smoking in the media. Media brings billions of impersonations of glamorized smoking and consumption of alcohol to millions of youths through TV, movies, video games, music, the Internet and advertisement in general.

Some adolescents feel guilty about spending their parent’s money on drugs or alcohol. However, many of them state their parents won’t even find out or have any notion they engage in such behaviors. Few adolescents perceive themselves to be mentally strong individuals; they can control themselves. However, with risk-taking behaviors, they don’t feel mentally strong. A study indicated, adolescents with risk-taking did experience emotions of being fearful, anxious, distressed, saddened, content and thrilled as a consequence. However, they rationalize their behavior by stating that they feel very superior, unique and significant as a consequence of risk-taking.

The dimension of sensation seeking and risk personality contributed significantly to patterns of adolescent risk behavior, distinctively to alcohol consumption, delinquency and a much minimal extent to drinking/driving, risky driving, and drug consumption. Furthermore, invulnerability dimension of personal fable also contributed significantly to patterns of risk-taking behavior. Hence, with the present study, although adolescents are aware of the harmful consequences attached to the risk behavior they engage in, many of them feel engaging in behaviors such as consumption of alcohol, smoking, drinking and smoking pot, for example, takes away life’s troubles they face every day. Adolescents rationalize their behaviors expressing, how stressful their life has been and engaging in these risk behaviors gives them pleasure/relieves them from stress life has to offer. The influence of peer pressure and the developmental stage that cause adolescents to unambiguously focus on the exhilaration, which accentuated the proliferation of adrenaline. The results further indicated adolescents continue to engage in risks, giving rise to the feeling of knowing it all; and risks alleviate boredom making life more enjoyable.

**SUMMARY AND RECOMMENDATION**

The major findings of the study indicated an adolescent’s pattern of thinking revolves around the fact that they are invincible or invulnerable. An adolescent’s high personal fable dimensions of invulnerability and personal uniqueness, causes them to further engage in risk behaviors. However, guilt does play an imperative role when they’re testing willpower in engaging in such risk behaviors. Factors such as media and peer pressure further deteriorate their willpower to say “NO.” Adolescents rationalize their behaviors, despite knowing the consequences. Adolescents want to experience sensations, enjoyment, and color in their daily routine, experiencing risk themselves. Hence the high functioning of their personal fable continually reinforces them to engage in such behaviors, as well as external factors contributing to it. The implications of the study are to formulate adolescents to reflect upon their actions cognitively from a different perspective. The imperative implication is to encompass supplementary life skill programs in schools. Furthermore; teachers, school counsellors, and parents have to be more involved in such programmes.

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REFERENCES


The Effect of One-Time Dynamic Soft Tissue Mobilization on Hamstring Flexibility Sustenance between Healthy Males and Females

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ABSTRACT

Background: Flexibility is considered an essential element of normal biomechanical functioning in sport. Though studies have proved that muscle flexibility is improved by massage but incorporation of active contractions into a massage protocol in the form of dynamic deep tissue model is found to be more effective than a classical massage alone. Objectives: The aim of this study is to find the effect of one-time dynamic soft tissue mobilization on hamstring flexibility sustenance between healthy males and females. Methods: It’s a Quasi Experimental Study with totally 48 subjects divided in to 23 males and 25 females were selected based on inclusion criteria were, healthy males and females aged between 18 and 25 years and limitation of 20° or more from full extension of knee as determined by the Active Knee Extension Test, then the classic massage followed by dynamic soft tissue mobilization was done. Results: P < 0.05 at 0 2nd, 4th, 8th 32nd minute, hence significant difference exists between the groups. P > 0.05 at 6th and 10th minutes, hence no significant difference exists between the Groups Conclusion: This study concluded that dynamic soft tissue mobilization had an immediate effect on hamstring muscle length in both males and females, but sustainability was more in females. Keywords: Soft tissue mobilization, hamstring flexibility healthy individuals.

INTRODUCTION

Flexibility is considered an essential element of normal biomechanical functioning in sport ¹. Benefits of flexibility including improved athletic performance, reduced injury risk, prevention or reduction of post-exercise soreness, and improved coordination ²,³,⁴,⁵. Some studies have shown that decreased hamstring muscle flexibility is a risk factor for the development of patella tendinopathy and patellofemoral pain ⁵,⁶, hamstring strain injury ⁶, and symptoms of muscle damage following eccentric exercise ⁷. Techniques commonly used by athletes to increase flexibility include static and ballistic stretching as well as proprioceptive neuromuscular facilitation. However recent literature regarding this has also been reported to impair subsequent force, jump height, sprint time, movement time and balance. Compared with common static stretching techniques, there are studies using massage that has shown to increase range of motion without exhibiting detrimental effect on force production ⁸, and studies have investigated the use of massage as a treatment option for delayed onset of muscle soreness. These studies have evaluated the use of massage to prevent strength losses, reduce muscle soreness and maintain joint range of motion ⁹,¹⁰. Though studies have proved that muscle flexibility is improved by massage but incorporation of active contractions into a massage protocol in the form of dynamic deep tissue model is found to be more effective than a classical massage alone ¹⁰. Hence a dynamic deep tissue model (DDTM) was developed in manual therapy to treat athletes with muscle tightness and associated soft tissue problems, which comprised of the classical massage component and dynamic component. Incorporation of such a dynamic component increases muscle perfusion and thus decrease muscle stiffness ¹¹. There are studies that have proposed that the hamstring muscle activation is less in females when compared to males in certain athletic tasks which put them more in risk for an injury.
This difference is because of the variations in anatomical and physiological functions between males and females. Since only limited studies have been done on dynamic soft tissue mobilization and its long term effects, this study is to do a further research on the sustenance of the massage with the dynamic deep tissue model between healthy males and females.

**METHOD**

*Selection and Description of Participants*

Totally 48 subjects divided in to 23 males and 25 females were selected based on inclusion criteria were, healthy males and females aged between 18 and 25 years and limitation of 20˚ or more from full extension of knee as determined by the Active Knee Extension Test. Previous history of hamstring injury in the past two years, low back pain, lumbar or lower limb neurological compromise, previous traumatic injuries including fractures and soft tissue injuries, Hypermobile joints, Inflammatory process or infections across the joints, menstruating females were excluded. Informed consent was obtained from those who willing to participate in the study. The study was conducted for 6 weeks, at SRM University, India.

*Intervention*

Procedure for dynamic soft tissue mobilization

Each subject was positioned in prone with the hip and knee in a neutral relaxed position and they received a massage on the hamstring muscle group. A classic massage was performed for 5 minutes, and then followed by the dynamic intervention which comprised of three components. First, the subject’s leg was passively extended and deep longitudinal strokes were applied in a distal to proximal direction to the area of hamstring tightness when the leg is moved to the hamstring lengthened position. The same sequence was performed in the next dynamic technique during which the subject actively extended their leg in order to obtain reciprocal inhibition of the hamstrings. In the final technique the subject had to work the hamstrings eccentrically by creating tension in the therapist’s hands as the muscle is elongated to the end range of motion. These sequences were performed by the fist of one hand that constituted of 5 deep longitudinal strokes during each sequence and terminated by 20 seconds of shaking. Another physical therapist was present to stabilize the knee such that the hip is at 90˚ flexion throughout the entire intervention. The overall treatment time being 8 minutes.

*Post-intervention measures*

The post test values were measured at 0, 2, 4, 6, 8, 10 and 32 minutes through active knee extension test.

*Active Knee Extension (AKE) Test*

Straight leg raise (SLR) or Active Knee Extension (AKE) with the hip positioned at 90 degrees of flexion. Gajdosik and Lusin advocate Active Knee Extension test as it is more selective for measuring hamstring length than the passive straight leg raise (SLR). The range of dependant knee extension with the hip flexed to 90 degrees by subject’s assistance is measured through Goniometer and throughout the Active Knee Extension (AKE) procedure; the opposite hip remained at 0 degree of flexion.

*Statistical analysis*

Comparing within the groups were done using Paired t-test and between Group A and Group B using the Independent t-test by SPSS Software version 17.0.

**RESULTS**

According to Table 1, The p value is 0.004, which shows there is a significant difference that exists between the two groups in zero minute; the p value is 0.005, significant difference that exists between the two groups at the second minute; p value is 0.035, which shows there is a significant difference that exists between the two groups at the fourth minute; p value is 0.070, which shows there is no significant difference that exists between the two groups at the sixth minute; p value is 0.05, which shows there is a significant difference that exists between the two groups at the eighth minute; p value is 0.055, which shows there is no significant difference that exists between the two groups at the tenth minute; The mean value of thirty-two minutes for Group A and Group B is 41.43 and 45.40 respectively, and the p value is 0.010, which shows there is a significant difference that exists between the two groups at thirty second minute.
<table>
<thead>
<tr>
<th>Post-Test</th>
<th>Groups</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero Minute</td>
<td>Group A</td>
<td>0.004</td>
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<tr>
<td></td>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td>Two Minutes</td>
<td>Group A</td>
<td>0.005</td>
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<td></td>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td>Four Minutes</td>
<td>Group A</td>
<td>0.035</td>
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<tr>
<td></td>
<td>Group B</td>
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</tr>
<tr>
<td>Six Minutes</td>
<td>Group A</td>
<td>0.070</td>
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<td></td>
<td>Group B</td>
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<td>Eight Minutes</td>
<td>Group A</td>
<td>0.050</td>
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<td></td>
<td>Group B</td>
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<tr>
<td>Ten Minutes</td>
<td>Group A</td>
<td>0.055</td>
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<td></td>
<td>Group B</td>
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<tr>
<td>Thirty-Two Minutes</td>
<td>Group A</td>
<td>0.010</td>
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<tr>
<td></td>
<td>Group B</td>
<td></td>
</tr>
</tbody>
</table>

P < 0.05 at zero, second, fourth, eighth and thirty-second minute, significant difference exists between the Group A and Group B at these minutes.

P > 0.05 at 6th and 10th minutes, no significant difference exists between the Group A and Group B at these minutes.

**DISCUSSION**

The main aim of the study is to compare the flexibility sustenance between males and females. This study demonstrated that the hamstring flexibility remained significantly increased in both the Group A (males) and the Group B (females). The post test values of the males obtained values were not consistent instead it started increasing after the zero minute. But in case of females, the post test values obtained were consistent up to 4th minute after which the values built up towards the pre-test values gradually and the post test values at 0, 2, 4 and 32 minutes obtained was statistically significant. The post values at zero minute of group A and group B showed a statistical significance (p 0.000). This increase can be attributed due to the physiological effects of massage combined with the dynamic component of the mobilization. Massage is thought to relax muscle, and could therefore help to enhance joint flexibility by reducing the passive tension of antagonistic muscles, and it also has a significant effect on properties of soft tissues like elasticity, plasticity and mobility.

Massage may increase the range of motion by reducing the muscle’s ability to detect pain and therefore allow a greater range of motion before experiencing discomfort. This theory refers to local lateral inhibition in the spinal cord. This inhibition maybe caused by tactile information stimulating larger rapidly conducting nerve fibers that could compete with and partially block smaller, slower nerve fibres that detect pain. However in two recent studies, hamstring massage was applied using typical Swedish massage protocols for 15-20 minutes. The outcomes of these studies showed no improvement. And there has been studies reporting increased hamstring flexibility by incorporation of a dynamic component to a classical massage for duration of 8 minutes and this proved out to be more effective than a classical massage alone. In the dynamic soft tissue mobilization component a target area of muscle tightness is identified and treatment is focused on that area as the muscle group is moved to the end range of motion. This soft tissue mobilization thus aims at restoring soft tissue mobility by reducing the soft tissue tightness. Given these results, dynamic soft tissue mobilization may also be a viable alternative in rehabilitation situations to help restore range of motion by increasing muscle flexibility. Patients with extremely limited range of motion or those who experience excessive pain during a passive or PNF stretching may benefit from this technique to regain...
flexibility. Massage may also benefit rehabilitation patients through psychophysiological mechanisms such as lower anxiety and increased relaxation. A study reported increased skin and muscle temperatures with massage in which their massage was a minimum of 5 minutes. The effect of Temperature on the viscoelastic property of the collagen in muscle is one of the significant factors in flexibility improvement. Temperature has an inverse effect on viscosity; hence as the temperature of the muscle is increased by soft tissue mobilization, viscosity decreases, and vice versa. Reduced viscosity facilitates relaxation of collagenous tissues. However, the collagen intermolecular bonding possibly becomes partially destabilized, enhancing the flow properties of collagenous tissues.

In this study the sustainability of flexibility is more in females than in males. This can be related to many factors like anatomical and physiological differences, smaller muscle mass, joint geometry and gender specific collagenous muscle structure. Studies by Michael J. Alter suggests that males have a pelvic that is heavier and rougher while females have broader and shallower hips than males and therefore a lower centre of gravity and hence greater range of motion in the pelvic region. Furthermore females have a less resistance to muscle lengthening than males which is attributed to their muscle mass and collagen arrangement. Hormonal factors should also be taken into account in gender consideration which attributes as an important factor in flexibility. The hormones in females maintain joint laxity. Evidence suggests that generally females are more flexible than males-5-7% more flexible. The relatively short duration for the maintenance of the hamstring flexibility may be governed by the Viscoelastic properties of the collagen as mentioned earlier. Viscoelasticity is a property in which deformation or lengthening of a tissue is sustained and the recovery is slow and imperfect when the deforming force has been removed. This property is more in muscles of normal persons and hence the extensibility and flexibility returns back after the force is removed. Hence the decrease in the flexibility with time and the greater sustenance of flexibility in females than in males is most likely due to the combination of the above mentioned factors. These results are unique and may be worthy of clinical considerations in rehabilitation where proprioceptive neuromuscular facilitation stretching or passive stretching becomes more painful to the patient or athlete. Anecdotally, massage is often viewed as a time consuming and non specific treatment option in clinical practice but it is however widely believed amongst athletes, coaches and therapists that massage is an effective treatment and it has been incorporated in pre-event and post- event therapy in sports and also in treatment of soft tissue lesions in clinical practice. Limitations are few individuals withdrew from the study because of personal issues. Force used for mobilization was not quantified. In Future, large sample size, long term effect, athlete’s population, anthropometric measures, Emotional, metabolic status and its influence on performance can be analyzed.

CONCLUSION

This study concluded that dynamic soft tissue mobilization had an immediate effect on hamstring muscle length and hence increased flexibility in both Groups A (males) and Group B (females). But the sustenance of that flexibility was more in Group B (females) than in Group A (males).

Ethical Clearance- Taken from Institutional Ethical committee

Conflict of Interest - Nil

Source of Funding – Self

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6. Witvrouw E, Bellemans J, Lysens R, Danneels L,


Effectiveness of Finger Weight-Lift Training and Finger Exercises on Hand Grip Strength among Elderly

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¹Dean I/c, ²BPT Student - Intern, SRM College of Physiotherapy, SRM University

ABSTRACT

Objective: To find out the effectiveness of finger weight lift - training and finger exercises on hand grip strength among elderly. Methodology Quasi experimental study design, pre and post type. 30 subjects were conveniently selected based on Inclusion and Exclusion Criteria and randomly divided into Group A and B. Each group consists of 15 samples. Finger exercises and finger weight -lift training were given to group A, and group B free from exercises. Results: In hand grip strength, GROUP A has not shown any change in mean value . In GROUP B there was decrease in mean value , when compared within groups. In Functional Independence Measure, has not shown any change in mean value in both groups . In hand grip strength, the posttest mean values of GROUP A and B were 19.74 and 17.89 when compared between the groups. Conclusion: The study was concluded that GROUP A with finger weight-lift training and finger exercises has not shown any statistically significant improvement in hand grip strength and Functional Independence Measure. GROUP B showed decrease in hand grip strength and there was no change in Functional Independence Measure.

Keywords: Hand grip strength, finger exercises, finger weight- lift training, elderly.

INTRODUCTION

Normal functioning is the process of aging, which influences by the functions of the body dealing with environment of the society and the behavioral (1) Grip strength is considered as the upper limb function which can be by a valuable examination (2,3). It is used as surrogate measurement of overall muscle strength (4).

The fitness of the muscle has been defined as strength of the muscle and power various properties of the muscle that which contributes to its quality and mass of the individual (5). Grip strength is one of the important techniques for measurement of muscle strength and assessment of muscle function (6). Hand grip strength is a morbidity and mortality predictor in middle aged and elderly subjects (6,7,8) and of older population’s disability (9).

Bone loss due to age is highly associated with less BMD (10) and with weak strength (11). Additionally, hand grip strength is useful for assessing the general health of older adults, and predicting both disability and mortality. Handgrip strength declines with age, and especially among individuals aged >80 years. A study of 8342 Danish aged 46 to 102 years showed linear declines in handgrip strength with age between 46 and 85 years, and rapid declines after 85 years (12). According to Rantanen et al, in all ages the intra-individual strength change over time were significant. In evaluating grip strength hand dynamometer is said to be a reliable instrument and is used in various rehabilitation purposes (13). The hand grip strength can be taken with different posture and positions of the body, testing time, body mass index, hand dominance and circumference, length of the limbs, that affects grip strength (14,15,16). In 1981, the Hand Therapists measured hand grip in sitting position with

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adduction of shoulder and rotation in neutral, flexion of elbow to 90 degree and forearm and wrist in neutral position for grip strength evaluation as the upper limb posture and the segments influence grip strength(17).

The handgrip strength of individuals aged 80 to 89 years is 37% less than that of individuals aged 30 years, and declines with average losses of 1.53 kg/year among men and 0.85 kg/year among women aged 85 to 89 years. Handgrip strength is an important factor which impacts and elderly individual’s ability to perform functional activities independently, which typically require maximum handgrip strength of 9 kg.

Skilled finger-movement training can be used to improve an individual’s ability to control sub maximal pinch force and hand function (18), (19). This study aimed to evaluate the effects of finger weight lift training and finger movements on hand grip strength and functional independence among elderly.

**METHODOLOGY**

The study design was Quasi experimental study, study type was Pre and Post type, sampling method was convenient sampling, the study setting was Birds Nest Old age home, Chennai. The Subjects were selected according to inclusion and exclusion criteria. The procedures were explained in detail and consent form was provided. Institutional Ethical Committee approval also obtained. 30 subjects aged between 65 to 74 years both male and female were included. Exclusion criteria were the individuals with Severe cognitive impairment, Severe arthritis or nervous diseases of the upper limb, Any condition that restrict the application of hand force, Upper limb congenital defects, unhealed fractures and dislocation. 15 participants were randomly assigned in intervention group(Group A) and 15 participants in control group(Group B). Subjects in Group A performed finger exercises combined with finger weight -lift training and subjects in the Group B did not receive any intervention. The hand grip strength using a hand dynamometer and functional independence was measured using a Functional Independence Measure instrument from both groups before the Intervention.

**GROUP- A**

GROUP-A performed set of exercises as finger movement exercises and finger weight –lift training.

**FINGER EXERCISES:**

All the finger exercises were performed in sitting. The finger exercises consists of set of movements. They were palm and opisthenar massage, pinching, stretching, finger counting, pairing, pressing, hand swinging, wrist pressing and turning, crooking and clenching.

Palm and opisthenar massage was done to the subjects by giving pressure between the web spaces of all the fingers and the palmar surfaces of the hand. In stretching each fingers were stretched. In finger counting the subjects were asked to count all fingers.

In clenching, the subjects was asked to make a fist and open. Pressing was done by pressing the wall or table with fingers. Hand swinging was done by swinging the hand by holding the stone suspended by thread.

Each and every movement was repeated 20 times. The exercises were conducted for about 20 minutes.

**FINGERWEIGHT-LIFT TRAINING:**

Following completion of the finger exercises, the weight lift training intervention was conducted. In the finger weight –lift training, a training bag capable of holding 600ml plastic bottles were designed and constructed. Each participants placed their arms at their sides, keeping their arms and wrist fixed. Then they crooked the straps of the training bag with their finger tips and the bag was lifted with the force produced by their fingers. The fingers were relaxed and the weight was lifted again, repeating the lifting exercise 50 times with 1 or 2 break periods, if needed. The finger weight -lift training was given for about 10 minutes thrice a week. This training was conducted once per day. The weight of the training bag was gradually increased from one to four bottles. This protocol followed for 4 weeks.

**GROUP-B** The control group did not receive any intervention for period of four weeks.

Hand grip strength were measured using a dynamometer. Participants were positioned with adducted shoulder, elbow flexed 90 degree, and forearm neutrally positioned, wrist dorsiflexed and ulnar deviation. The proper use of hand held dynamometer was taught to subjects. The subjects were given warm up exercise. Once told to begin the grip the subjects increased their grip strength to the best. After a break of
5 min, the participants was tested a second time. The larger value obtained from the two tests is recorded as the hand grip strength of the participants.

The Functional Independence Measure instrument was used to assess the functional ability of elderly. Posttest measures were taken after 4 weeks.

**RESULTS**

The hand grip strength and Functional Independence Measure was calculated and tabulated. The data analysis was done by using IBM SPSS version 20.

**TABLE 1: COMPARISON OF POST-TEST MEAN VALUES OF GROUP A AND GROUP B FOR HAND GRIP STRENGTH**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>Post-test</td>
<td>19.74</td>
<td>15</td>
<td>6.16072</td>
</tr>
<tr>
<td>GROUP B</td>
<td>Post-test</td>
<td>17.89</td>
<td>15</td>
<td>4.74605</td>
</tr>
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</table>

**TABLE 2: COMPARISON OF POST-TEST MEAN VALUES OF GROUP A AND GROUP B FOR FUNCTIONAL INDEPENDENCE MEASURE**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>Post-test</td>
<td>112.20</td>
<td>15</td>
<td>10.2553</td>
</tr>
<tr>
<td>GROUP B</td>
<td>Post-test</td>
<td>112.60</td>
<td>15</td>
<td>13.1301</td>
</tr>
</tbody>
</table>

**TABLE 3: COMPARISON OF GROUP A AND GROUP B FOR HAND GRIP STRENGTH**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>Sig.(2-tailed) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>Pre &amp;post test</td>
<td>1.2800</td>
<td>1.7469</td>
<td>2.838</td>
</tr>
<tr>
<td>GROUP B</td>
<td>Pre &amp;post test</td>
<td>-.00867</td>
<td>1.84576</td>
<td>-.018</td>
</tr>
</tbody>
</table>

**TABLE 4: COMPARISON OF GROUP A AND GROUP B FOR FUNCTIONAL INDEPENDENCE MEASURE**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>Sig.(2-tailed) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>Pre &amp;post test</td>
<td>.2000</td>
<td>.5606</td>
<td>1.382</td>
</tr>
<tr>
<td>GROUP B</td>
<td>Pre &amp;post test</td>
<td>.2667</td>
<td>.7037</td>
<td>1.468</td>
</tr>
</tbody>
</table>
According to Table 1, in hand grip strength, the posttest mean values of GROUP A and B are 19.74 and 17.89 when compared between the groups. There is decrease in the mean values of GROUP B than GROUP A of hand grip strength compared between the groups. According to Table 2, in Functional Independence Measure has not shown any change in post-test mean value of GROUP A and B from 112.20 to 112.60 when compared between groups.

According to Table 3 & Table 4 the P value is 0.013 which <0.05, it is statistically significant. It shows that only the hand grip among the GROUP A has significantly improved than GROUP B among the within group comparison. The GROUP B has not shown any statistical significance for both the hand grip and also for the Functional Independent Measure when compared with its pretest values.

**DISCUSSION**

The objective of the study was to find out the effectiveness of finger weight-lift training and finger exercises-palm and opisthenar massage. According to the statistical analysis, hand grip among the GROUP A has significantly improved than GROUP B among within group comparison. In GROUP B has not shown any statistical significance for both the hand grip and also for the functional independence measure when compared with its pretest values.

J.J.Keyser, A.M.Jette(2001) concluded that finger movement exercise program can also improve age related regression of hand function of the individuals. Thus it improves muscle strength by the repeated movements and the physical function of the individual who perform the finger exercises. K.L.Rush ,W.E.Watts (2013) stated that that older adults who are physically active can regain some amount of lost strength as they age. Finger movement exercises are helpful in regaining the lost muscle strength and thus improving their functions. Ranganathan VK, Siemionow V, Liu JZ. Guang (2001) concluded that skilled finger-movement training such as stretching, wrist pressing, clenching, clasping and counting etc can be used to improve an individual’s ability to control sub maximal pinch force and hand function. This training program induced a positive change in excitability of motor neurons innervating a muscle for controlling grip. These improvement allow elderly to have more independent life.

K.Kawanabe, V.Sagahl, Singh M.A (2007) stated that the whole body vibration exercises and muscle strengthening exercises have a great role in the improvement of muscle strength in the elderly aged sixty seven years. This study showed improvement of the hand grip strength with finger exercises and finger weight-lift training which are contradictory to our results. The results of GROUP B was supported by Anton JM, Taekema D, Draen D, Gussekloo (2011) concluded that the elderly aged >65 years who did not underwent any exercises showed declined at an average of the hand grip strength values.

Many studies shows that there is improvement in hand grip strength with finger exercises and finger weight-lift training. In this study there is no change in hand grip strength may be because of less study duration and less number of samples. Hence the study concluded that there was no change in hand grip strength in GROUP A and decrease in hand grip strength in GROUP B. In Functional Independence Measure there was no change in both GROUP A and B.

**CONCLUSION**

The study was concluded that the Experimental group who underwent finger weight-lift training and finger exercises has not shown any statistically significant improvement in hand grip strength and Functional Independence Measure.

Control group who were not given any intervention showed decrease in hand grip strength and there was no change in Functional Independence Measure. The limitations were the intervention period used in this study was relatively short and the sample size was small. The recommendations in this study were the hand
grip strength influencing factors such as gender, age, and hand dominance can be taken. With the different positions of elbow, forearm and wrist, hand grip strength can be analyzed. Further studies can be analyzed by comparing the young old and older old in geriatric population. Further studies and observations are needed to confirm our results with long duration to determine whether the types of intervention used in this study can improve handgrip strength and Functional Independence Measure. Larger sample size can be studied.

Conflict of Interest: Conflict of interest declared none.

Source of Funding: Self

REFERENCES


ABSTRACT

**Background:** The case of stunting in Bengkulu province is ranked sixteen highest in Indonesia. It has increased from 36% in 2007 to 40% in 2013. The purpose of the study is to know the dominant factors that influence the incidence of stunting in Bengkulu Province.

**Method:** The study design was Cross-sectional with multistage random sampling technique. The total samples analyzed in this study were 739 infants who attained the age of 6-24 months from the 2015 Nutrition Status Monitoring Survey in Bengkulu Province. Data included sex, birth weight, age of weaning, implementation of Early Breastfeeding Initiation, maternal age, maternal education, maternal occupation and Body Mass Index (BMI). The data were collected using questionnaires. Secondary data were analyzed using logistic regression.

**Result:** The study found 27.1% stunting stunting and 56% male, normal birth weight 97.2%, age of weeding <2 years counted 64.7%, no early breastfeeding initiation (58.1%), mother’s age ≥ 20 years old 93.2%, low education of mother 47.8%, unemployed mothers 72%, and abnormal BMI of mother 59.4%. Factors associated with the incidence of stunting are maternal work and education. Maternal employment is the dominant factor affecting the incident of stunting in Bengkulu Province. Toddlers with working mothers will be 1.47 times more likely to have stunting compared to toddlers with unemployed mothers.

**Conclusion:** The socialization of stunting to worker mothers is much needed. The work makes a woman spending more time outdoors so that attention to the child’s dietary habit is reduced.

**Keywords:** Stunting Determinant, Mother’s job, Efforts to prevent stunting.

INTRODUCTION

Latest data of World Health Organization (WHO) revealed that Asia ranked as the first of stunting case in the world. About 86.5 million under five children in Asia underwent Stunting. The Southeast Asia was the second highest which was 15.1 million under five children after South Asia. It is estimated that there were 162 million short toddlers in 2012, if the trend continues without any reduction effort, it is projected to be 127 million in 2025. As many as 56% of short children live in Asia and 36% in Africa.

The results of the Basic Health Research (Riskesdas) in 2013 showed that the national short prevalence in 2013 was 37.2%, which meant an increase compared to 2010 (35.6%) and 2007 (36.8%). The short prevalence of 37.2 percent consisted of very short 18.0 percent and 19.2 percent short. Public health problems are considered severe when the prevalence of stunting was 30%-39% and it was serious if the prevalence was > 40%.

Stunting is more vulnerable to illness and into adolescence tends to be overweight and prone to non-communicable diseases. Stunting children are widely accepted predictors of low-quality human resources, and decrease the productive capacity of a nation in the future. In the Nutrition Review by UNICEF (2012) it was explained that interventions to lower stunting should start precisely before birth, with prenatal and maternal nutrition, and continue until the age of two.
Bengkulu Province is in the sixteenth highest case of stunting in Indonesia. It increased every year, 36% in 2007, 31.6% in 2010 and 40% in 2013. If it does not immediately followed up then the stunting case will increase continuously.

**MATERIAL AND METHOD**

A community based on cross-sectional study design was conducted in ten districts Bengkulu province (Bengkulu, Rejang Lebong, Lebong, North Bengkulu, Muko-Muko, Seluma, South Bengkulu, Kaur, Bengkulu Tengah, Kepahyang) from May to September, 2015. The population was mothers who had children 6-24 months. Multistage cluster sampling was used to select the study population. Eligible mothers were invited to interview using questionnaires to gather data.

The total samples analyzed in this study were 739 toddlers who were 6-24 months. It was taken from the result of Nutrition Status Monitoring Survey in 2015, Bengkulu Province. Data covered sex, birth weight, age of weaning, implementation of Early Breastfeeding Initiation, maternal age, maternal education, maternal occupation and Body Mass Index. The data were collected using questionnaire. The data was analyzed using computer program. Chi-square test was used to compare the proportions. Multivariate multiple logistic regression analysis was used to determine the dominant factor of stunting. The level of statistical significance set up at p <0.05.

**RESULT**

Table 1: Characteristic of mother and under two year children can be seen.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunting case</td>
<td>Normal</td>
<td>539</td>
<td>72.9</td>
</tr>
<tr>
<td></td>
<td>Stunting</td>
<td>200</td>
<td>27.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>414</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>325</td>
<td>44</td>
</tr>
<tr>
<td>Weight of Birth</td>
<td>Normal</td>
<td>718</td>
<td>97.2</td>
</tr>
<tr>
<td></td>
<td>BBLR</td>
<td>21</td>
<td>2.8</td>
</tr>
<tr>
<td>Age of weaning</td>
<td>≥ 2 years old</td>
<td>261</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>&lt; 2 years old</td>
<td>478</td>
<td>64.7</td>
</tr>
<tr>
<td>Early Breastfeeding Initiation</td>
<td>Yes</td>
<td>310</td>
<td>41.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>429</td>
<td>58.1</td>
</tr>
<tr>
<td>Maternal age</td>
<td>≥ 20 Tahun</td>
<td>689</td>
<td>93.2</td>
</tr>
<tr>
<td></td>
<td>&lt; 20 Tahun</td>
<td>50</td>
<td>6.8</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>High</td>
<td>115</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>272</td>
<td>36.8</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>352</td>
<td>47.8</td>
</tr>
<tr>
<td>Maternal Occupation</td>
<td>Employee</td>
<td>207</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>532</td>
<td>72</td>
</tr>
<tr>
<td>Maternal Body Mass Index</td>
<td>Normal</td>
<td>300</td>
<td>40.6</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>439</td>
<td>59.4</td>
</tr>
</tbody>
</table>

Based on table 1, There is toddler stunting (27.1%), males (56%), normal birth weight (97.2%), people of weaning age <2 years (64.7%), people who did not doing early breastfeeding initiation (58.1%), mothers with the age ≥20 year (93.2%), mothers with low education (47.8%), unemployed mothers (72%), and abnormal body mass index of mothers (59.4%).

Factors Related to Stunting

The result of bivariate analysis using chi-square test to see the relationship of sex, birth weight, age of weaning,
initiation of early breastfeeding, mother age, education, occupation and body mass index with Stunting can be seen in table 2 as follows

**Tabel 2: Factors associated with the incidence of stunting in Bengkulu Province**

<table>
<thead>
<tr>
<th>Research variables</th>
<th>Category</th>
<th>Normal</th>
<th>Stunting</th>
<th>Total</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>302</td>
<td>72.9</td>
<td>112</td>
<td>27.1</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>237</td>
<td>72.9</td>
<td>88</td>
<td>27.1</td>
</tr>
<tr>
<td>Weight Birth</td>
<td>Normal</td>
<td>525</td>
<td>73.1</td>
<td>193</td>
<td>26.9</td>
</tr>
<tr>
<td></td>
<td>BBLR</td>
<td>14</td>
<td>66.7</td>
<td>7</td>
<td>33.3</td>
</tr>
<tr>
<td>Weaning age</td>
<td>≥ 2 Tahun</td>
<td>193</td>
<td>73.9</td>
<td>68</td>
<td>26.1</td>
</tr>
<tr>
<td></td>
<td>&lt; 2 Tahun</td>
<td>346</td>
<td>72.4</td>
<td>132</td>
<td>27.6</td>
</tr>
<tr>
<td>Early breastfeeding initiation</td>
<td>Yes</td>
<td>219</td>
<td>70.6</td>
<td>91</td>
<td>29.4</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>320</td>
<td>74.6</td>
<td>109</td>
<td>25.4</td>
</tr>
<tr>
<td>Maternal age</td>
<td>≥ 20 Tahun</td>
<td>503</td>
<td>73</td>
<td>186</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>&lt; 20 Tahun</td>
<td>36</td>
<td>72</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>Maternal education</td>
<td>High</td>
<td>92</td>
<td>80</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>204</td>
<td>75</td>
<td>68</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>243</td>
<td>69</td>
<td>109</td>
<td>31</td>
</tr>
<tr>
<td>Maternal occupation</td>
<td>Employee</td>
<td>142</td>
<td>68.6</td>
<td>65</td>
<td>31.4</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>397</td>
<td>74.6</td>
<td>135</td>
<td>25.3</td>
</tr>
<tr>
<td>Maternal body mass index</td>
<td>Normal</td>
<td>220</td>
<td>73.3</td>
<td>80</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>319</td>
<td>72.7</td>
<td>120</td>
<td>27.3</td>
</tr>
</tbody>
</table>

Based on the bivariate analysis, there was no correlation among gender, weight birth, weaning age, early breastfeeding initiation, maternal age, and BMI toward the stunting case. But there was a correlation between maternal education and maternal occupation with the stunting case.

**Multivariate Analysis**

Multivariate analysis had done to see which one was the dominant factor that affected stunting. Since having done the multivariate analysis, the result can we see in table 3.

**Table 3: Multivariate analysis of Stunting case in Bengkulu province**

<table>
<thead>
<tr>
<th>Analysis Steps</th>
<th>B</th>
<th>P</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal education</td>
<td>0.314</td>
<td>0.082</td>
<td>1.369</td>
<td>0.961–1.951</td>
</tr>
<tr>
<td>Maternal occupation</td>
<td>0.389</td>
<td>0.020</td>
<td>1.476</td>
<td>1.064–2.047</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.667</td>
<td>0.000</td>
<td>0.189</td>
<td></td>
</tr>
</tbody>
</table>
Table 3, showed that the most dominant factors were the maternal education and occupation. The under five children with employee mothers would be at risk of stunting 1.476 times compared to the under five children with unemployed mothers. Thus, the toddlers with maternal low education background would be at risk of stunting 1.369 times compared to the toddlers with medium and high education background of mothers.

**DISCUSSION**

Factors Affecting Stunting

The results showed that education is a factor affecting the incidence of stunting in Bengkulu Province. The results of this study were consistent with the Shine study (2017) that it showed the prevalence of stunting in children aged 6-59 months which determinant were gender, maternal age, maternal education, maternal occupation, income, postnatal care visit, first milk given, bottle milk feeding\(^6\). Seedhoom (2014) showed the results that factors affecting stunting were low birth weight, short stature, mother education, lack of knowledge of mother about nutrition\(^7\). According to Senbajo (2011) the main factor affecting stunting in Abeokuta, Nigeria was mother education. It was an important factor in child growth\(^8\). Higher maternal education will improve the mother’s behavior in seeking information about family health and use of health services thereby reducing the incidence of stunting.

Semba (2008), stated that there is a strong relationship between the two variables\(^9\). Nzala (2011) showed that factors associated with the incidence of stunting were gender and low maternal education\(^10\). The most dominant factors affecting the incidence of stunting were gender, maternal employment status, family history of TB, antenatal care visits, parental illiteracy, home density, mass media, and water availability\(^11\). Wealth index, maternal exposure to mass media, child age, child size at birth, and parental education related to stunting\(^12\).

According to Paudel (2012), several stunting-related factors in Nepal, including socioeconomic status, environmental factors, exclusive breastfeeding, supplementary food intake, food diversity and diarrheal diseases\(^13\). Exclusive breastfeeding, socioeconomic and infant with LBW were factors related to the cause of stunting in Nepal\(^14\). This was also reinforced by the results of the Susanti study (2015) which showed the consumption of maternal food during pregnancy, exclusive breastfeeding, additional feeding history, infectious disease, nutrition, immunization and family economic factors were the contributing factors in stunting case in Papua\(^15\).

Some of the determinants were age, sex, socioeconomic status, and four main findings. The findings were (1) 2-year-olds were predictable stunting, (2) children who were introduced food too early can increase underweight, (3) vaccine and immunization of infectious diseases can be a protective factor of stunting case, and (4) live with non-biological parents could increase the stunting case\(^16\). The factors that mediate the immediate causes of stunting events were: insecurity household food, inadequate health care and dietary patterns and unhealthy household and environmental conditions (low income, poor sanitation and hygiene behavior). But the basic causes of this stunting event were education, and socio-political issues of economics\(^4\).

Policy of Controlling Stunting

Provincial and district/municipal governments have intervened to prevent/reduce the number of under five children with stunting through the program: 1) Fulfill the nutritional needs for pregnant women. Pregnant women should get adequate nutritional food, nutritional supplementation (iron substance or fe), and monitor their health; 2) Exclusive breastfeeding (ASI) until the age of 6 months and after 6 months of age are given Complementary foods of exclusive breastfeeding with sufficient quantity and quality; 3) monitoring the growth of under five children in “posyandu” is a very strategic effort to detect early growth disorder; 4) increasing access to clean water and sanitation facilities, and maintaining cleanliness of the environment; 5) provide a breast milk corner at work.

Approach to prevent stunting such as micronutrient supplements for pregnant women and children (especially iron, zinc, calcium, and folate); increased availability of enriched fats Commercial products such as Nutributter and Plumpy’nut; encouraging breastfeeding during the first six months of life; and efforts to improve the complementary nutritional quality for baby food when weaned\(^17\). Continuous exposure to human and animal waste can lead to chronic bacterial infections. These infections caused by poor sanitation and hygiene practices. Those made the nutrition difficult to absorb by the body. One study found that Bangladeshi children
with access to drinking of clean water, healthy toilets, and facilities for hand washing with soap increased 50% in height for age scores compared with controls of children who did not expose the access. Similar results emerged from a study in Sudan. Children living with poor hygiene became dwarfed by frequent chronic diarrhea. The authors revealed a strong link between growth disturbance and diarrhea of five or more episodes in the first two years of life.

Government’s policy by instructing all workplaces to provide premises for breastfeeding mothers, in an effort to improve infant health and control stunting for infants and children in the future. The American Academy of Pediatrics policy supports the publication of the benefits of breastfeeding for infants, mothers, and communities although the economic, cultural and political pressures often confound decisions about infant feeding. Breastfeeding ensures optimal achievement for the health, growth, and development of infants and children. Beside of that, the overall level of breastfeeding initiation got near to Healthy Community Goals, both the level and duration of exclusive breastfeeding. Furthermore, the concepts and recommendations of Annual Summit on Breastfeeding are to familiarize policy makers, non-governmental organizations, media representatives, business leaders and the like with health needs communities to urge for breastfeeding support. A special place for breastfeeding for working mothers is absolutely necessary for the healthy growth and smart children.

CONCLUSION

In Bengkulu province found 27.1% of stunting. The result of analysis showed the stunting case appeared because of the parents’ education and occupation. The occupation was the most dominant factor. Employed parents should continuously give their attention to the dietary habit and healthy of the children. The government’s policy was appropriate as the effort to prevent stunting through nutrition fulfillment of pregnancy women, exclusive maternal breastfeeding, additional nourishment of maternal breastfeeding, controlling the toddlers’ growth at “posyandu”, increasing access to the clean water and sanitation facilities, as well as keeping the environment clean and providing area for maternal breastfeeding at working places.

Conflict of Interest Statement: The authors declare that there is no conflict of interest.

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Ethical Clearance: Health Research Ethics Committee, Health Polytechnic of Health Ministry Bengkulu.

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Children’s Understanding of Cancer: Developmental Trend in their Conceptual Complexity

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ABSTRACT

This study aimed to understand children’s conceptualization of the disease cancer and track the changes in the complexity in comprehending cancer with progression in class. The sample was drawn from three schools that enrolled socioeconomically disadvantaged group of children enrolled from class VI to class X. Results were analyzed using a combination of qualitative and quantitative analysis. Content analysis identified a total of seven themes into which the responses were distributed. The complexity of conceptualization was measured by evolving Entropy scores or Divergence Index. It clearly tracked a progressive developmental trend in complexity of the schema among the children.

Keywords: cancer, conceptual complexity, cancer awareness, children’s concept, concept development

INTRODUCTION

Cancer is one of the predominant causes of mortality and morbidity with an increasing incidence in India. Besides genetic and biological predisposition, lifestyle is identified as a precipitating factors. As per the projection of Indian Council of Medical Research² the incidence of cancer would increase to over 1.73 million by 2020. This should raise an alarm culminating in plan of action for the generation for which the projection is relevant. Given the fact that the projections are relevant for the present population of children, educating them can be a step towards cancer prevention in India. Studies conducted in India about children’s awareness of cancer provide varied results. A study on children of class VI to X revealed that only 16.72% have heard of cancer. ⁴ Contrary to this, other studies indicated knowledge of cancer among 52.6%³ and 83.59%⁶ of children.

As mentioned earlier, cancer is related to lifestyle¹ that includes health promotion and health risk behavior. Among others, smoking, chewing tobacco and alcohol were identified as the most common risk factor for cancer by school children⁶. Research on children revealed that knowledge on the risk of passive smoking and use of cooking oil was low, though active smoking was rightly identified². Misconception of cancer being contagious or communicable existed⁴.

It is significant to understand children’s concept of cancer itself because knowledge about the risk factors will assume significance only when their understanding of cancer as a disease is correct. Accuracy of knowledge has been found to increase and became differentiated with age⁵⁶.

Some of the most common methods used for research on children are questionnaire¹⁰, interview⁴, and projective techniques such as draw and write⁹, Q methodology¹¹, closed ended questions⁴, open ended questions and so on. Open ended questions despite the disadvantages of excessive details, provide the scope for free expression, particularly when children are the respondents. Keeping this in view, the present study is an attempt to investigate the knowledge level of school
children regarding cancer using open ended question and a combination of qualitative and quantitative analysis.

Research questions

The main research questions of this study were:

How do school children conceptualize cancer?

Does the concept of cancer develop in its complexity across age?

OBJECTIVES

To understand the conceptualization of cancer among children from 6th class to 10th.

To track the divergence index in comprehending cancer among these children.

METHOD

Participants

The sample selection was made in two stages. In the first stage three schools catering to the children from lower socioeconomic groups, managed by government, Private trust were identified. All the children from class 6th through 10th who were willing to participate and sign the assent were included in the final sample. A total of 639 students constituted the sample. Of this 344 (53.83%) were boys and 295 (46.16%) were girls.

Instrument

A sheet of paper with one side of it to record the personal information of the respondents and the other side with a single open ended question – “what do you know about cancer?” was used as the tool in this study. The space provided for their response was limited to six lines.

Procedure

The children were assembled in their respective classrooms. Those willing to participate were made to sign the assent form. The children were given verbal instructions about their task. They were instructed to write their response in the blank space provided beneath the question. One could explain the concept in more than one way. No time limit was set to complete the task. However the maximum time taken was 15 minutes.

Content analysis and Coding

The total response sheets were systematically assigned a numerical code for the purpose of identification. Owing to irrelevant or incomprehensible responses, 47 response sheets were discarded. The remaining responses were read and re-read independently by three investigators, who coded each response with a theme. The thematic coding of the three investigators was collated. Wherever there was total agreement the responses were classified under the coded themes. But in case of responses where the investigators differed in coding, discussions were held among the three investigators to arrive at a decision on its category on consensus. A total of 882 responses from 639 students were classified under 7 themes. The responses that indicated wrong notion of cancer were brought under the head of ‘misconceptions’.

Derivation of Divergence Index as a measure of conceptual complexity:

Responses across the classes that were distributed along the seven themes were given a quantitative expression by taking class-wise frequencies under each theme as the basic value for further calculations. The assumption for measuring conceptual complexity for each class was that, the more the spread of responses across the themes, the higher is the divergence, indicating complexity of the schema. The divergence is termed as “entropy”. The term entropy has its genesis in Physical Sciences where it indicates ‘disorderliness’ or absence of a predictable pattern indicating a convergence. In the context of expressing the responses of a class across themes, we define entropy as divergence of responses across the themes.

An attempt was made to calculate entropy for each class using a formula.

To evolve the entropy value, the first step was to calculate the probability of the number of responses given by any individual student in a class under a theme.

\[
\text{Probability (P)} = \frac{\text{Number of responses per theme of the class}}{\text{Total number of responses of the class}}
\]

‘P’ stands for probability.

This value of P is then formed into a logarithmic value for better meaningfulness. Following is the
formula applied.

$$\text{Absolute Entropy (E)} = \sum (I \times P)$$, where

$$I = - \log P$$

Where, $I$ = Probability

The ‘probability’ value is influenced by the size of the class. Thus, the entropy value which is the logarithmic transformation of the ‘$P$’ is affected by the class size. Since, the ‘$n$’ across classes is not uniform, the entropy values of different classes cannot be compared. Hence, it was necessary to adjust the entropy value for class size. This is done by evolving the Balancing Factor ($B_F$) by dividing the sample size of the class with total sample by applying the following formula.

$$B_F = \frac{\text{Sample size of a class of students}}{\text{Total sample of students}}$$

When the absolute entropy is divided by the Balancing Factor ($B_F$), what is arrived at is Divergence Index (DI) also called as Neutralized Entropy ($E_n$).

$$\text{DI} = \frac{E}{B_F}$$

RESULTS

The results are presented in qualitative as well as quantitative forms. The qualitative aspect of results refers to the content analysis and presentation of the themes that emerged from the responses of each class. The quantitative aspect of results refers to the outcome in terms of divergence in conceptualizing cancer. This has been arrived at by calculating entropy values using a mathematical formula.

Seven themes emerged from the responses covering almost all dimensions related to the disease. It is surprising to note that the responses covered even the psychosocial aspects related to cancer. This reflects the exposure that the children had about the disease.

Misconceptions regarding cancer were also considered. The subthemes under this were consumption of excess sugar, caffeine (tea/coffee) and mosquito bite as a cause or classifying cancer as communicable disease.

Figure 1 depicts the distribution of responses across seven themes and misconceptions. It may be observed from the figure that 38% of responses related to the causes of cancer followed by the generic descriptions of cancer (32%). Responses to the extent of 10% of responses were related to the symptoms of cancer. Responses pertaining to side effects of treatment and treatment of cancer figured to 8% and 6% respectively. In all, prevention of cancer and psychosocial correlates were found to be contributing 3% and 1% to the total responses. Misconceptions such as consumption of sugar, drinking impure water, mosquito bite as the causes of cancer and that cancer is a communicable disease consisted of 2% of overall responses.

![Fig 1 Distribution of responses across theme](image-url)
In table 1, the trends obtained in entropy and response ratio are discussed.

### Table 1 Summary showing class-wise trend of awareness on cancer disease

<table>
<thead>
<tr>
<th>Class</th>
<th>n(Participants)</th>
<th>Responses</th>
<th>Absolute Entropy(E)</th>
<th>P</th>
<th>E/DI</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>137</td>
<td>189</td>
<td>0.63</td>
<td>0.21</td>
<td>2.68</td>
</tr>
<tr>
<td>7</td>
<td>144</td>
<td>200</td>
<td>0.60</td>
<td>0.22</td>
<td>2.24</td>
</tr>
<tr>
<td>8</td>
<td>152</td>
<td>203</td>
<td>0.53</td>
<td>0.23</td>
<td>2.89</td>
</tr>
<tr>
<td>9</td>
<td>143</td>
<td>204</td>
<td>0.64</td>
<td>0.22</td>
<td>4.82</td>
</tr>
<tr>
<td>10</td>
<td>64</td>
<td>76</td>
<td>0.48</td>
<td>0.10</td>
<td>5.60</td>
</tr>
</tbody>
</table>

*Note. N=Total number of participants; E = Absolute entropy; P = probability of responses; DI = Divergence Index or E(Neutralized entropy)*

An attempt was made to examine if the students of different classes differed in having divergence in conceptualizing cancer. This is measured by calculating the ‘Entropy’ explained earlier. Table 1 presents the Absolute Entropy values and Neutralized Entropy ($E_n$) values or Divergence Index (DI). The progressive growth in Divergence Index across classes indicate that as the students’ progress in their class, higher is their spread of responses across the themes, indicating complexity in their schema of ‘cancer’. While there is a minor increase in DI between class VII (DI=2.24) and class VIII (DI=2.89), a spurt is noticed between class VIII (DI=2.89) and class IX (DI=4.82) and class IX (DI=4.82) and class X (DI=5.60). An inexplicable drop is also observed from class VI (DI=2.68) to class VII (DI=2.24).

### DISCUSSION

Looking across the classes, we see a progressive increase in Divergence Index or neutralized entropy across the classes. Although there was only a marginal increase in the neutralized entropy from class VI through class VIII, with a slight dip in class VII, we see a steep rise between IX and X classes. This is in consistence with Piaget’s cognitive theory\(^{12}\), which talks about expansion in different schema across age through the process of assimilation and accommodation. This is also supported by a study which indicated the knowledge of breast cancer to increase with level of education\(^{13}\). This increase could also be a reflection of the school syllabus\(^{13}\). A scrutiny of the syllabus in the subject of Biology of the present sample revealed a strong thrust on health related topics in the textbook of class X. Bibace and Walsh\(^{12}\) suggested that during the concrete operational stage, children’s explanations of illness revolve around Contamination (transmission through physical contact) and Internalization (external agent enters body through swallowing or inhaling and affects internal organs). During the formal operational stage, children explain illness through physiologic and psychophysiologic causes. Physiologic explanations by children usually comprise of internal organs not functioning properly. Psychophysiologic reasons include how emotional states can affect our bodily functions. Results of the present study reflect similar findings with children of class X (who are in the age group of 15 to 16 years when their cognitive development is in formal operation stage) giving multidimensional explanation towards cancer, that correctly included physiological and psychological aspect.

We can see that the children’s “general concept” about cancer comprised of it being fatal, dangerous or harmful, an uncontrolled growth of cells, a non-communicable disease, highly prevalent, incurable, curable with early detection, availability of good treatment and reduced recurrence rate. These perceptions of children are found to be in line with the facts stated in research articles\(^{14,15,16,17,18}\).

The less discussed causes like obesity, sedentary lifestyle, hepatitis B & C virus (HBV/HCV), human papilloma virus (HPV), immune system dysfunction, aging, hormonal imbalance\(^{19}\) need to be emphasized either through curriculum or awareness programmes. Similarly, orientation for children on treatment procedure must include various option like radiation,
surgery, hormonal therapies and individual differences on side effects of treatment.\textsuperscript{19, 20}

It is very surprising and encouraging to find the children referring to psychosocial correlates of cancer that not only included certain affect states such as ‘sadness’ in patients but also the impact on the family. Building upon this other psychological offshoots like anger, stress, anxiety and quality of life, may also be brought into their awareness.\textsuperscript{21, 22}

Though only 2\% of responses constituted misconceptions, they should be dissipated to prevent uncalled for stigma.

**Implications**

This study that combined the qualitative and quantitative approach may be considered as a robust method to understand children conceptualization of cancer. Further the statistical application of computing Neutralized Entropy or Divergence Index enabled very accurate calculation of conceptual complexity. The results of the study clearly indicate a developmental progression in conceptualization of cancer as a disease among children.

**Limitations**

One limitations of the study is restricting the sample to children coming from low socioeconomic family backgrounds. Future studies may be planned on the cross-sectional population.

**Ethical Clearance:** Permission was obtained from the Principals of the participating schools prior to the commencement of the study. Assent was also taken from all the participants prior to their participation.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Parental Knowledge, Attitude and Practices Regarding Antibiotic use for Respiratory Tract Infections in Children

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ABSTRACT

Background: Antibiotic treatment is a prerequisite for modern healthcare and the misuse of antibiotics has become a major public health issue worldwide. The aim of the study was to determine the Knowledge, Attitude and Practices (KAP) of parents regarding antibiotic use for Respiratory Tract Infections (RTIs) in children and explore the factors associated with parents self-medicating (SM) children with antibiotics.

Method: A descriptive single centered study was conducted among 60 parents of children with RTIs attending Pediatric units of a selected hospital, Kochi. The data which include sociodemographic variables, knowledge questionnaire, attitude scale and checklist were used to assess the KAP of parents regarding antibiotic use for RTIs in children. Both descriptive and inferential statistics were used for the analysis of data.

Results: The analysis of the data revealed that most of the parents (61.7%) had average knowledge, favourable attitude (95%) and none had poor practices regarding antibiotic use for RTIs in children. The study results showed that 16.8% of the parents had self-administered medication to their children during RTIs. There was a significant correlation \((r=0.32; p=0.01)\) between knowledge and attitude of the parents regarding antibiotic use for RTIs in children. The association between KAP with the selected demographic variables was not significant at \(p< 0.05\)

Conclusion: The results of the study conducted revealed that lack of complete knowledge and safe practices regarding antibiotic use still persists among the parents and some of the parents used to self-medicate their children. If appropriate antibiotic therapy is not made mandatory, it is possible that even minor infection may become threatening in the future.

Keywords: KAP- Knowledge, Attitude and Practices, RTI- Respiratory Tract Infections, SM- Self-Medication.

BACKGROUND

The infectious disease burden in India is among the highest in the world and respiratory infections are one of the leading causes of morbidity and mortality in children. In 2011, WHO set the theme of World Health Day as “Combat Drug Resistance”, WHO calls for urgent and concerted action by governments, health professionals, industry and civil society, and patients to slow down the spread of drug resistance.\(^1\) Antibiotic\(^2\) treatment is an essential requirement for modern healthcare. When antibiotics were introduced for the first time in the 1940s, they were hailed as “wonder drugs”, the miracles of modern medicine. Widespread infections that killed many millions of people every year could now be cured.\(^1\) But, frequent and inappropriate use of antibiotics can cause bacteria or other microbes to change their nature and destruction of the normal flora, allowing for selective overgrowth of antibiotic-resistant strains.
Antibiotic resistance is one of the major public health problems especially in developing countries where relatively easy availability and higher consumption of medicines have led to a higher incidence of inappropriate use of antibiotics. Centre for Disease Dynamics, Economics and Policy (CDDEP), New Delhi, done a study titled ‘The State of World Antibiotics 2015’ which shows that in 2010, India was the largest consumer of antibiotics ahead of China and the US. As per Global Antibiotic Resistance Partnership (GARP) - India, the public’s lack of knowledge about the appropriate use of antibiotics is one of the possible reasons for antibiotic overuse and both Pediatricians and parents contribute to this problem.

Infections include Penicillin resistant streptococcus pneumonia, Methicillin resistant staphylococcus aureus (MRSA) and multi resistant mycobacterium tuberculosis are exacerbated by the misuse of antibiotics are increasing in prevalence worldwide, resulting in infections that are difficult and expensive to treat.

Although Carbapenems are expensive, sales in Egypt, India, and Pakistan have increased with over the counter availability. There has been an increasing trend toward practicing self-medication (SM) phenomenon in both developed and developing countries in the recent years. If antibiotics become ineffective, then established and newly emerging infectious diseases, which are becoming an increasing threat, may lead to emergence of antimicrobial resistance or multiple resistant organisms that would be difficult to treat, difficulty in controlling the diseases, ineffective delivery of the health care services, high morbidity rate, prolonged hospitalization period, rising the treatment costs, drug toxicity and the development of side effects.

Because of misuse and overuse of antibiotics, certain bacteria have been resistant to even the most powerful antibiotics available today. A few years ago, 10,000 units of Penicillin given four times daily for four days cured pneumococcal pneumonia. Today, someone with a resistant case of pneumococcal pneumonia could receive 100 times this dose and still die from the infection. In India, along with the drug-resistant bacteria, the lack of access or delayed access to effective antibiotics leads to more deaths rates.

Children represent a population of particular concern because they have high rates of respiratory infections as well as high rates of antibiotic use with antibiotic-resistant pathogens. Children depend on their parents for medication. Parent’s limited knowledge, beliefs, expectations and practices towards antibiotics is an important contributing factor in rational antibiotic use and the management of childhood illness and therefore minimizing development of antibiotic resistance. Therefore, examining the parental knowledge, attitude and practices toward antibiotic use for RTI in their children is of great value and helps in devising suitable educational interventions for them.

**MATERIALS AND METHOD**

A descriptive single centered study was conducted among 60 parents of children with RTIs attending Pediatric units of a selected hospital, Kochi at the time of data collection. The theoretical framework was based on the Health Belief Model. The approach used in the study was quantitative descriptive research design. Convenience sampling technique was used to select parents who met the inclusion criteria. Permission to conduct the study was obtained from the head of Pediatric department and ethical clearance certificate was obtained from the Institutional Ethics Committee. A written informed consent was obtained from all samples before starting data collection. The data collection instruments used in the study includes- a semi structured knowledge questionnaire to assess the socio-demographic data of the parents, self-administered questionnaire to assess the knowledge of parents on use of antibiotic for respiratory tract infections in children, rating scale to assess the attitude of parents on use of antibiotics for respiratory tract infections in children and a check list to assess the parental practices regarding antibiotic usage for respiratory tract infections in children and factors associated with parents self-medicating children.

**RESULTS**

In the present study majority of the children (40%) of the study participants belongs to the age group of 1-5 years. Half of the children (50%) were males. Majority of the parents (56.7%) belongs to the age group of 20-30 years. Almost 35% of the parents cleared higher secondary and 35% were graduates. Majority of the participants (86.7%) were mothers and 65% of the mothers were homemakers. Almost 77% of parents belonged to rural areas. More than half of children (53%) had history of frequent hospitalization. The major source of health information of majority of the parents (30%) was television.
Figure 1 shows that most of the children (21.7%) received Ceftriaxone, Amoxicillin (15%) and Azithromycin (5%).

Figure 2 shows that majority of the parents (61.7%) had average knowledge, 28.3% had good knowledge and 10% had poor knowledge regarding antibiotic use for respiratory tract infections in children.

As far as the attitude is concerned (95%) had favourable attitude regarding antibiotic usage for respiratory tract infections in children. Good practices regarding antibiotic use has been seen in majority of the parents (83.3%) whereas 16.7% had fair practices and none had poor practices regarding antibiotic usage for respiratory tract infections in children.

Table 1 shows that out of 60 participants, 10(16.8%) were self-medicating their children. The most common reason for self-medicating their children were previous experience with similar symptoms (40%) and because the Pediatrician always prescribes the same medication (30%)

In the present study, there was a significant correlation between knowledge and attitude (r=0.32; p=0.013) (Figure 3)

**DISCUSSION**

The first objective of the study was to determine the knowledge, attitude and practices of parents regarding antibiotic use for respiratory tract infections in children.

Attitude and practices are the consequences of knowledge. In the present study majority of the parents (61.7%) had average knowledge, favourable attitude (95%) and good practices (83.3%) with regard to antibiotic use for respiratory tract infections in children. The parents were confused about the use of antibiotics for either bacteria or virus and believed that antibiotics can be used to treat any type of infections. Only 22% of parents knew that antibiotics are used to treat bacterial infections. Interestingly, most of the parents (21.6%) identified Paracetamol as an antibiotic used to treat respiratory tract infections and fever.
Majority of parents (83.4%) identified incomplete course of antibiotic develops resistance and 65% of parents acknowledged that antibiotics have side effects, where as in a cross sectional study conducted by Teck KC⁹ reported that only 23.4% of the respondents knew that antibiotics have side effects.

Almost 28% parents were in the opinion of stopping antibiotics when the child starts feeling better which is much less than the findings of Chan G C and Tang SF¹⁰ in which 85% of the parents stop antibiotics once the children improved symptomatically. The present study revealed that only 3% parents found to have reused the left over antibiotics and shared antibiotics among their children for similar symptoms of respiratory tract infections. Some of the parents (11.7%) believed that there is no harm in following the old prescription when experiencing the same illness again.

Even though it has been widely recognized that URTIs are most often of viral etiology still antibiotics are prescribed for children with URTIs. In the present study, majority of the children (72%) had upper respiratory tract infections in which 49% of the children were given antibiotics and all children with lower respiratory tract infections received IV antibiotics. Majority of the children with lower respiratory tract infections had pneumonia (47%).

Second objective was to explore the factors associated with parents self-medicating children with antibiotics.

In the present study 16.8% parents admitted that they used to self-medicate their child during respiratory tract infections. A similar study was conducted in rural china by Yu M¹¹ found 62% of the parents had self-medicated their children with antibiotics.

In the present study, majority of the parents (70%) used to self-medicate their children with antipyretics (Paracetamol) for fever and cough and 30% of parents self-administered antibiotics to their children during respiratory tract infections. The main factors associated with parents to self-medicate their children were previous experiences with similar symptoms and because the Pediatrician always prescribes the same medication. This study findings were supported by a cross sectional descriptive study conducted by Jasim AL⁶ and found around 41.1% of the parents practice self-medication and the main reason of self-medication was dealing with same current ailments previously.

Third objective was to find the correlation between knowledge, attitude and practices of parents regarding antibiotic use for respiratory tract infections in children.

The study results shown that there was a significant correlation (r=0.32; p=0.013) between knowledge and attitude of parents regarding antibiotic use for respiratory tract infections in children. Similar results were obtained by Moustafa Mohamed S M⁵ among 60 mothers in Egypt and found a positive correlation between mother’s knowledge and their attitude towards the use of antibiotics in their children with URTI.

Fourth objective was to find the association of parental knowledge, attitude and practices with the selected demographic variables.

The average age of the child of the participants was 4.43 years with standard deviation 3.40. The association between knowledge, attitude and practices with the selected demographic variables like age and gender of the child, parental age, relation with the child, educational level, occupation, number of children, area of residence was not significant at p<0.05. Panagakou SG¹² identified that being a father, having low education and being without experience in recurrent URTIs were significantly associated to inadequate knowledge, inappropriate attitudes, and wrong practices.

Most of the parents of children with frequent hospitalization had lack of adequate knowledge regarding proper use of antibiotics. Hence, parents need to be well informed regarding the child’s disease, ways to prevent RTIs and safe use of antibiotics.

Fifth objective was to develop a pamphlet regarding safe use of antibiotics which can be distributed.

For any educational intervention to be successful and for the changes to be sustained, it should change the knowledge, attitudes and practices (KAP) of the target group.¹³ In the present study, a pamphlet was prepared on the basis of the study findings to provide more information to parents regarding safe use of antibiotics. It includes points to be followed for safe use of antibiotics, need of antibiotics, antibiotic resistance and ways to prevent from getting an infection. Various studies conducted previously also suggested that parental
educational interventions will be effective to promote rational and safe use of antibiotics.

CONCLUSION

The results of the study conducted revealed that majority of the parents had average knowledge, favourable attitude and none had poor practices regarding antibiotic use for respiratory tract infections in children, but still lack of complete knowledge and safe practices regarding antibiotic use persists among the parents and some of the parents used to self-medicate their children. Simple methods to avoid infections and practice safe antibiotic use such as practicing hand hygiene, appropriate use of prophylactic antibiotic, avoiding self-medication and restrictions on unnecessary prescriptions may go a long way in preventing antimicrobial abuse. Finding of the study would help the public, health professionals and students to identify areas of limited knowledge, attitude and practices to devise suitable educational interventions for the public to practice prudent and rational use of antibiotics.

LIMITATIONS

As the researcher used convenience sampling technique to conduct the study, majority of the participants selected were mothers and the proportion of fathers were very minimal. This minimizes the generalizability of the findings.

Conflict of Interest: Nothing specific- can use the study findings with proper citation of authors name.

Source of Funding: Self-finance

Acknowledgment: Nil

REFERENCES


Informal Healthcare Providers in India: Illegal and Indispensable

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ABSTRACT

The corresponding author who served in Supaul district of Bihar state of India as an Acute Flaccid Paralysis (AFP) Surveillance Medical Officer (SMO) with the World Health Organisation between May 2011 and July 2013, observed that the district had a preponderance of quackery. A look at the public healthcare system in the district with a population of 2.2 million shows just why this situation exists. According to the latest data available on government websites, the shortfall of Health Sub Centres, Primary Health Centres and Community Health Centres in Supaul district is an astonishing 58%, 87% and 88% respectively. These numbers are not significantly different from the numbers for the rest of the state of Bihar. There is no evidence of any political will to tackle this shocking shortfall. The Bihar government has actually reduced the allocation to health for the financial year 2017-18 to Rs.7001.52 crore from Rs.8234.70 crore in 2016-17. Estimates say 70 to 80 percent of healthcare providers in India are informal providers. This ratio can go up to 30 informal providers for every public sector doctor in certain rural areas. Upto 75 percent of primary care visits in rural areas can be to an informal provider. If we must have equitable access to healthcare in India, it would be imperative to involve these informal providers.

Keywords: Supaul, Bihar, Surveillance Medical Officer, quacks, informal health providers

INTRODUCTION

Sustainable Development Goal no.3 of the United Nations Development Programme (UNDP) is “Good Health and Well Being”. An important aspect of ensuring Good health and well being is access to healthcare. The corresponding author who served in Supaul district of Bihar state of India as an Acute Flaccid Paralysis (AFP) Surveillance Medical Officer (SMO) with the World Health Organisation between May 2011 and July 2013, observed that the district had a preponderance of quackery. The Supreme Court of India defines a quack as a “person who does not have knowledge of a particular system of medicine but practices [it] and [is] a mere pretender of medical knowledge or skills.” The SMO office for AFP surveillance relied on a network of healthcare providers to report cases of AFP. More than 80% of the 200 odd healthcare providers on the list operative for Supaul district were quacks (hereafter referred to as informal providers). And this was not a comprehensive list either. There were many more, but the SMO office listed only the more popular ones who were most likely to see cases of AFP. A few km from the district administrative and law enforcement headquarters, informal provider clinics abounded, on the highway that runs through the district, with several more such clinics in the villages on either side of the highway. The main reason for this is the abject failure of the government to ensure access to safe healthcare, primary or otherwise. Almost all of the few qualified doctors in the district worked in the very small district headquarters (which was relatively urbanised) while the
people of the hinterland had to fend for themselves.

A look at the public healthcare system in the district with a population of 2.2 million shows just why this situation exists. According to the latest data available on government websites, the shortfall of Health Sub Centres, Primary Health Centres and Community Health Centres in Supaul district is an astonishing 58%, 87% and 88% respectively. These numbers are not significantly different from the numbers for the rest of Bihar. Even among the health centres that are functioning, a plethora of issues exist: shortage of manpower; irrational allocation of manpower; irrational location of health centres; absence of list of drugs; lack of permanent infrastructure, hygiene, own communication system, residential facilities, regular electricity, waste disposal facility, borewell, piped water supply, separate examination room, clinic room, labour room, boundary wall, furniture or equipments.

Table 1 illustrates the gap in public health infrastructure between the Indian Public Health Standards (IPHFS) recommended centre:population ratios and the actual centre:population ratios in Supaul district of Bihar state of India.

<table>
<thead>
<tr>
<th>Sub centres</th>
<th>Primary health centres</th>
<th>Community health centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended ratio as per Indian Public Health Standards (IPHFS)- centre:population</td>
<td>1:5000</td>
<td>1:30,000</td>
</tr>
<tr>
<td>Expected number of centres</td>
<td>425</td>
<td>71</td>
</tr>
<tr>
<td>Actual number of centres</td>
<td>178</td>
<td>9</td>
</tr>
<tr>
<td>Actual ratio - centre:population</td>
<td>1:11,930</td>
<td>1: 235,946</td>
</tr>
<tr>
<td>Percentage shortfall</td>
<td>58%</td>
<td>87%</td>
</tr>
</tbody>
</table>

Table 1. A comparison of the recommended and actual ratios of Sub centres, Primary health centres and Community health centres in Supaul district of Bihar state of India.

The Bhore committee of pre-independent British India had, in 1946, recommended Primary Health Centres (PHCs) for every 40,000 population. This was supposed to be only a short term measure. The committee envisaged the scaling up of the number of PHCs till it reached a ratio of one PHC for every 20,000 population. 70 years of independence later, we have PHCs for every 235,000 population (2,123,518 rural population/9 PHCs) in Supaul, each PHC thus serving more than ten times the population that it was originally intended to serve. Nothing can be a bigger indictment of the government’s attitude to healthcare.

There is no evidence of any political will to tackle this shocking shortfall. When The Telegraph was doing a story on the sorry state of public health services in Bihar, calls to the health minister went unanswered. The deputy secretary of the health department, referring to the Union statistics and programme implementation ministry’s National Sample Survey Office (NSSO) data, told The Telegraph: “I have not come across any such data compilation, I am unaware of this data.” The shortfall of health centres does not seem like it will change very soon anytime in the future, given that the Bihar government has actually reduced the allocation to health for the financial year 2017-18 to Rs.7001.52 crore from Rs.8234.70 crore in 2016-17.

Estimates say 70 to 80 percent of healthcare providers in India are informal providers, with the political capital Delhi having 2 informal providers for each of its 40,000 registered doctors. This ratio can go up to 30 informal providers for every public sector doctor in certain rural areas. Upto 75 percent of primary care visits in rural areas can be to an informal provider. If we must have equitable access to healthcare in India, it would be imperative to involve these informal providers. There has been stiff opposition from the Indian Medical Association (IMA) to any attempts at the possible legitimisation of these informal providers, but given how interwoven they are with their communities, the popular support and political patronage that they enjoy, the fact that in many settings patients trust them more than public sector doctors and India’s abject failure at
building a half-way decent public healthcare system, it is becoming increasingly obvious that training and regulating these informal providers is the only way forward. Das et al, in a study published in Science, concluded that training informal providers increased correct case management rates. Further, training did not lead informal providers to violate rules with greater frequency or worsen their clinical practice, both of which are concerns that have been raised by the Indian Medical Association (IMA). The findings suggested that multitopic medical training may offer an effective short-run strategy to improved health care provision and complement critical investments in the quality of public healthcare. With this being the case, it would be beneficial if informal healthcare providers were provided with training that would eliminate the most common medical errors that they make and enable them to provide a certain minimum level of care.

CONCLUSION

In Supaul the corresponding author saw that they had formed associations and held official meetings periodically. They had elected office bearers. These informal providers are doing something which by its very definition is illegal but we believe is indispensable in the current Indian healthcare landscape. If they have the capacity to organise themselves so well, it would be reasonable to believe that they would be receptive to inputs that would enhance their skill levels, resulting in a higher quality of healthcare delivery. Informal providers treat millions of patients every day in India. There is simply no wishing them away, no matter what the IMA or anyone else feels. This is especially so in geographies that simply do not have enough qualified medical practitioners. Given that there is almost no political will to do anything substantial to increase access to healthcare, we fail to see any other alternative to training and capacity building of the informal providers. The sooner that the authorities realise this and draw up a comprehensive plan for them, the sooner we will see an increase in equitable access to a better standard of healthcare across the Indian hinterland.

Ethical Clearance: As this was a literature review based opinion piece, ethical clearance is not a prerequisite, and hence was not sought.

No Funding

No Conflict of Interest.

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Premenstrual Symptoms and Lifestyle Factors
Associated with it among Medical Students

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ABSTRACT

Background: Premenstrual symptoms are a constellation of somatic and emotional symptoms commonly affecting women in reproductive age group. Apart from causing physical, emotional distress, they can influence daily activities and reduce productivity of women.

Objective: To determine the prevalence of premenstrual symptoms and lifestyle factors associated with it among medical students.

Methodology: This cross sectional study was conducted among 209 medical students and interns of a private medical college. A self-administered questionnaire was used to assess menstrual history, premenstrual symptoms and diet. Physical activity was assessed using International Physical Activity Questionnaire.

Results: The median (IQR) age of the study participants was 21(20, 22). Feeling of tiredness (30.6%) and presence of mood swings (25.4%) reported by at least a quarter of the study participants were the major somatic symptom and emotional/behavioral symptoms respectively. On univariate and multivariate analysis, coffee consumption was positively associated with premenstrual symptoms [Adjusted OR=1.85, 95% CI =1.02-3.34, p=0.042]. Though statistically not significant, a higher proportion of those with premenstrual symptoms were physically inactive as compared to those without symptoms (39.7% Vs. 35.2%).

Conclusion: Excessive caffeine intake and physical inactivity can have an influence on premenstrual symptoms. Adopting healthy lifestyle could positively help the medical students to reduce the impact of premenstrual symptoms on their social activities and interpersonal relationships and increase their productivity.

Keywords: Premenstrual symptoms, diet, physical activity

INTRODUCTION

Premenstrual symptoms, are physical and emotional changes which appear in the body in relation to menstrual cycle. They usually begin within 5 days from and resolve within 4 days after onset of menstrual bleeding.¹ Studies have shown that over 80% of women in reproductive age group suffer from premenstrual symptoms.² Premenstrual symptoms possibly have a multifactorial etiology including abnormal serotonin function, presence of progesterone, exercise habits, smoking, alcohol consumption, use of caffeinated beverages.³ However, the exact etiology of premenstrual symptoms still remains unclear. Premenstrual symptoms affect women across all the social classes. Interestingly, studies in different countries have shown that premenstrual symptoms are more common and of severe nature in high level educated women and this is possibly...
attributed to higher stress among them.\textsuperscript{4,5} As medical students are generally under tremendous academic pressure, the added stress due to premenstrual symptoms could affect their daily activities and interpersonal relationships. Hence, the present study was conducted to evaluate the association between lifestyle factors and premenstrual symptoms.

**METHODOLOGY**

A cross sectional study was conducted among first to final year medical students and interns of a private medical college. Anticipating the prevalence of premenstrual symptoms to be 51.2%\textsuperscript{6}, relative precision of 15% and non-response rate of 20 %, the sample size was estimated to be 204. The study included participants having regular menstrual period for at least last 3 months. Participants with history of diabetes, hypertension, anxiety/depression or on hormonal therapy were excluded. A self-administered questionnaire was given to all participants to collect details of age, menstrual characteristics, premenstrual symptoms and diet.

**Definitions used in the study:**

- **Pre Menstrual Symptom:** somatic or emotional/psychobehavioural symptom that begins at least 5 days before/resolves within 4 days of onset of bleeding
- Interferes with some of the normal activities
- Present for at least 3 consecutive menstrual cycles.

- **Regular menstruation:** Menstrual bleeding which occurs in equal intervals between 21 and 35 days.\textsuperscript{7}

- **Amount of bleeding:** Depending on the number of pads used per day as:-
  - Little: (<4 pads/day),
  - Moderate: (5–10 pads/day)
  - Heavy: (2 pads at a time)\textsuperscript{8}

- **Disorders of menstruation:**
  - Menorrhagia: Cyclic regular bleeding excessive in amount or duration. If, duration of bleeding is more than 6 days/menstrual flow is heavy throughout the bleeding.
  - Polymenorrhea: Cyclic menstrual cycles, lasting less than 21 days.\textsuperscript{7}
  - Oligomenorrhea: Cyclic menstrual cycles, lasting more than 35 days.\textsuperscript{7}
  - Hypomenorrhea: Cyclic menstruation, with less than 2 days of active bleeding and scanty blood loss.\textsuperscript{7}

Anthropometric measurements such as weight and height were recorded. Body Mass Index (BMI) was calculated and classified based on Indian classification.\textsuperscript{9}

The International Physical Activity Questionnaire (IPAQ) was used to assess physical activity of the participants and is classified as Inactive, Minimal active and Health Enhancing Physical Activity (HEPA).\textsuperscript{10}

Data was analyzed by using the Statistical Package of the Social Science (SPSS) software for Windows, version 15. Categorical variables have been expressed as proportions. Median (IQR) has been reported for continuous variables. Univariate and multivariate analysis was done to find association between premenstrual symptoms and lifestyle factors associated with it. Unadjusted and adjusted odds ratio (OR) with 95% confidence interval (CI) have been reported. A p value <0.05 was considered to be statistically significant.

**RESULTS**

The study included 209 female medical students from first to final year and interns. Table 1 describes the baseline characteristics of the study participants. Median (IQR) age of the study participants was 21(20, 22) and the median (IQR) age at menarche was 12 (12, 13) yrs. The median (IQR) duration of menstrual cycle was 29(28, 30) days and the median (IQR) duration of bleeding was 5(4, 5) days. As per the number of pads used per day, 206(98.6%) of them had little bleeding (<4 pads/day) and 3(1.4%) had moderate bleeding (5-10 pads/day). Menorrhagia (bleeding >7 days) and oligomenorrhoea was seen in 9.1% and 1.9% respectively among the study participants. None of the participants were found to have polymenorrhoea or hypomenorrhoea. The mean (SD) BMI among the study participants was 22.6(4.4) kg/m\textsuperscript{2}.
Table 1. Baseline information of the study participants (n=209)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>n (%)</th>
<th>Variables</th>
<th>Category</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>18-20</td>
<td>86(41.1)</td>
<td>Junk food consumption</td>
<td>&lt; 1-3 per month</td>
<td>40(19.1)</td>
</tr>
<tr>
<td></td>
<td>&gt;20</td>
<td>123(58.9)</td>
<td></td>
<td>At least once per week and more</td>
<td>169(80.9)</td>
</tr>
<tr>
<td>Age at menarche (yrs)</td>
<td>9-12</td>
<td>115(55.0)</td>
<td>Eating raw vegetable / fresh fruit</td>
<td>&lt; 1-3 per month</td>
<td>26(12.4)</td>
</tr>
<tr>
<td></td>
<td>13-18</td>
<td>94(45.0)</td>
<td></td>
<td>At least once per week and more</td>
<td>183(87.6)</td>
</tr>
<tr>
<td>Duration of cycle (days)</td>
<td>21-35</td>
<td>205(98.1)</td>
<td>Skipping meals</td>
<td>&lt; 1-3 per month</td>
<td>94(45.0)</td>
</tr>
<tr>
<td></td>
<td>35-40</td>
<td>4(1.9)</td>
<td></td>
<td>At least once per week and more</td>
<td>115(55.0)</td>
</tr>
<tr>
<td>Duration of bleeding (days)</td>
<td>2-3</td>
<td>21(10.0)</td>
<td>Coffee consumption</td>
<td>&lt; 1-3 per month</td>
<td>82(39.2)</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>169(80.9)</td>
<td></td>
<td>At least once per week and more</td>
<td>127(60.8)</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>19(9.1)</td>
<td>Tea consumption</td>
<td>&lt; 1-3 per month</td>
<td>115(55.0)</td>
</tr>
<tr>
<td>BMI kg/m²</td>
<td>&lt;22.9</td>
<td>135(64.6)</td>
<td></td>
<td>At least once per week and more</td>
<td>94(45.0)</td>
</tr>
<tr>
<td></td>
<td>&gt;23</td>
<td>74(35.4)</td>
<td>Physical activity</td>
<td>Inactive</td>
<td>79(37.8)</td>
</tr>
<tr>
<td>Type of diet</td>
<td>Vegetarian</td>
<td>87(41.6)</td>
<td></td>
<td>Minimal active</td>
<td>47(22.5)</td>
</tr>
<tr>
<td></td>
<td>Nonvegetarian</td>
<td>122(58.4)</td>
<td></td>
<td>HEPA</td>
<td>83(39.7)</td>
</tr>
</tbody>
</table>

Proportion of study participants having any premenstrual symptoms was 121(57.9%). As shown in table 2, feeling tired (30.6%) was the most common and having food cravings (3.3%)/sleep disturbances (3.3%) were the least prevalent symptoms.

About 73 (34.9%) of the study participants reported that premenstrual symptoms reduced their productivity.
Interference to participating in social activities was said to be an issue of concern by 68(32.5%) of the study participants. One fifth (21.1%) of the study participants stated that premenstrual symptoms affected their relationship with others.

Table 3. Association between menstrual characteristics, lifestyle factors and presence of any premenstrual symptom among the study participants on Univariate analysis (n=209)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Premenstrual symptom present</th>
<th>Premenstrual symptom absent</th>
<th>OR 95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>18-20</td>
<td>45(37.2)</td>
<td>41(46.6)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;20</td>
<td>76(62.8)</td>
<td>47(53.4)</td>
<td>1.47(0.84-2.57)</td>
<td>0.17</td>
</tr>
<tr>
<td>Age at menarche (yrs)</td>
<td>9-12</td>
<td>71(58.7)</td>
<td>44(50.0)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13-18</td>
<td>50(41.3)</td>
<td>44(50.0)</td>
<td>0.7(0.40-1.22)</td>
<td>0.21</td>
</tr>
<tr>
<td>Duration of cycle (days)</td>
<td>21-35</td>
<td>118(97.5)</td>
<td>87(98.9)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-40</td>
<td>3(2.5)</td>
<td>1(1.1)</td>
<td>2.21(0.22-21.62)</td>
<td>0.49</td>
</tr>
<tr>
<td>Duration of bleeding (days)</td>
<td>2-3</td>
<td>12(9.9)</td>
<td>9(10.2)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>98(81.0)</td>
<td>71(80.7)</td>
<td>1.03(0.41-2.58)</td>
<td>0.94</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>11(9.1)</td>
<td>8(9.1)</td>
<td>1.03(0.29-3.61)</td>
<td>0.96</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>&lt;22.9</td>
<td>81(66.9)</td>
<td>54(61.4)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;23</td>
<td>40(33.1)</td>
<td>34(38.6)</td>
<td>0.78(0.44-1.39)</td>
<td>0.405</td>
</tr>
<tr>
<td>Type of diet</td>
<td>Vegetarian</td>
<td>56(46.3)</td>
<td>31(35.2)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nonvegetarian</td>
<td>65(53.7)</td>
<td>57(64.8)</td>
<td>0.63(0.35-1.11)</td>
<td>0.11</td>
</tr>
<tr>
<td>Junk food consumption</td>
<td>&lt; 1-3 per month</td>
<td>23(19.0)</td>
<td>17(19.3)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least once per week and more</td>
<td>98(81.0)</td>
<td>71(80.7)</td>
<td>1.02(0.50-2.04)</td>
<td>0.95</td>
</tr>
<tr>
<td>Eating raw fruit/vegetable</td>
<td>&lt; 1-3 per month</td>
<td>15(12.4)</td>
<td>11(12.5)</td>
<td>0.99(0.43-2.27)</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>At least once per week and more</td>
<td>106(87.6)</td>
<td>77(87.5)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Skip meals</td>
<td>&lt; 1-3 per month</td>
<td>57(47.1)</td>
<td>37(42.0)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least once per week and more</td>
<td>64(52.9)</td>
<td>51(58.0)</td>
<td>0.81(0.46-1.41)</td>
<td>0.46</td>
</tr>
<tr>
<td>Coffee consumption</td>
<td>&lt; 1-3 per month</td>
<td>40(33.1)</td>
<td>42(47.7)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least once per week and more</td>
<td>81(66.9)</td>
<td>46(52.3)</td>
<td>1.84(1.05-3.25)</td>
<td>0.03</td>
</tr>
<tr>
<td>Tea consumption</td>
<td>&lt; 1-3 per month</td>
<td>69(57.0)</td>
<td>53(60.2)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least once per week and more</td>
<td>52(43.0)</td>
<td>35(39.8)</td>
<td>0.64(0.65-1.99)</td>
<td>0.64</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Inactive</td>
<td>48(39.7)</td>
<td>31(35.2)</td>
<td>0.97(0.51-1.82)</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>Minimal active</td>
<td>22(18.2)</td>
<td>25(28.4)</td>
<td>0.55(0.26-1.11)</td>
<td>0.108</td>
</tr>
<tr>
<td></td>
<td>HEPA</td>
<td>51(42.1)</td>
<td>32(36.4)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
On univariate analysis, coffee consumption at least once a week and more was 1.84 times more likely to be associated with premenstrual symptoms as compared to those without premenstrual symptoms and this difference was statistically significant (95% CI 1.05-3.25, p=0.03). Though statistically not significant, a higher proportion of those with premenstrual symptoms were physically inactive as compared to those without symptoms (39.7% Vs. 35.2%).

Variables with p value of <0.2 on univariate analysis were included in multivariate analysis. Following multivariate analysis, coffee consumption at least once a week or more was independently associated with premenstrual symptoms [Adjusted OR=1.85, 95% CI =1.02-3.34, p=0.042]. Age of the study participants, age at menarche, type of diet and physical activity didn’t show any association with presence of premenstrual symptoms.

DISCUSSION

The findings of the present study suggest that premenstrual symptoms are common among medical students. A lower prevalence of premenstrual syndrome was found in studies among medical students by Rumana AM et al (31.1%) and Balaha MH et al (36.5%) which was in contrast to the present study. However, studies by Karout N et al (54.1%) and Nisar N et al (51%) reported prevalence which was coherent with the present study findings.

Charu S et al reported that average duration of cycle was 29.5±3.3 days and mean age at menarche to be 12.6±1.1 yrs which is in line with the median duration of menstrual cycles and age at menarche reported in the current study. In the present study 98.1% of study participants had menstrual cycles with a duration of 21-35 days which was similar to findings by Charu S et al (97.2%).

While the study by Seedhom et al found the mean(SD) BMI of medical students to be 24.1(±4), higher than present study, results from Charu S et al reported a mean (SD) BMI of 21.6(3.2) which was similar to the findings of the present study.

The type of premenstrual symptoms reported and their proportions varied to a great extent across studies. Kaur N et al found that a higher proportion of participants to have the premenstrual symptoms such as irritability (64.5%), fluctuation of mood (59.2%), breast tenderness (42.3%) and difficulty in concentration (41.9%) among nursing students as compared to the present study.

Another study by Aref N et al found that the frequency of menstrual symptoms among medical students with respect to breast pain (54%), change of mood (54%), food craving (52%), and headache (25.9%) which are much higher than current study findings. Observations from the study by Kural M et al among 18-25 year old college going students showed that prevalence of breast pain, irritability, fatigue, anxiety and emotional disturbances to be 16.3%, 42.9%, 23.4%, 10.3% and 29.8% respectively. Another study by Nisar N et al reported that the top three symptoms among medical students were found to be anger/irritability (83.8%), anxiety (81.8%) and feeling tired (78.7%). These observations are in contrast to the present study findings.

While menstruation is a physiological phenomenon, premenstrual symptoms can have influence on daily activities of women in the reproductive age group. A study by Nusrat Nisar N et al reported that premenstrual symptoms affected the productivity among 55.5% of the participants as compared to 34.9% in the present study. The same study also reported that two third (64.6%) of study participants to have said that premenstrual symptoms affected their relationship with others which is in contrast to the present study (21.1%).

While consistent associations have been found between certain variables such as excess coffee consumption and consumption of junk and sweet foods and premenstrual symptoms, contrasting results have been seen with physical activity, and BMI. A study by Sahin S et al found that consumption of coffee (OR=1.84), Salty foods (OR=1.92), consuming oily foods (OR=2.4) and regular exercise (OR=1.7) were associated with premenstrual syndrome. Association with coffee consumption mentioned in the earlier study is line with the present study. Another study by Seedhom AE et al found that physical inactivity, consumption of sweet tasting food items and fast food, decreased intake of vegetables and fruits and excess consumption of caffeinated beverages were associated with premenstrual syndrome. While the study by Seedhom AE et al found that frequency of premenstrual syndrome was lower among those who were overweight/obese, Masho M et al observed that obesity was a risk factor for premenstrual syndrome. However no such pattern was observed in the present study.
Since this was a cross sectional study, the causality between factors studied and premenstrual symptoms could not be established.

**CONCLUSION**

Lifestyle factors such as diet and physical activity can have an influence on premenstrual symptoms. Reduction in consumption of caffeinated beverages and increasing the physical activity are advisable to students in this context. As medical students are under a lot of academic stress, the added strain due to premenstrual symptoms could affect their productivity. Incorporation of healthy dietary practices and an exercise plan as a part of daily routine is desirable.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Institutional Ethics Committee clearance was obtained. Informed consent has been taken from the study participants.

**REFERENCES**


Impact of Biomedical Waste Management Training Intervention on Knowledge, Attitude and Practices of Health Care Workers in Telangana

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¹Assistant Professor, ²Post graduate Community Medicine, MNRMC Sangareddy

ABSTRACT

Background: About 80 percent of total waste generated in healthcare activities is a general waste but the remaining 20 percent of it involves toxic, infectious and radioactive waste and 20 percent of this non-general biomedical waste is highly dangerous and can be a serious threat to the community and the environment if it is not segregated disposed of adequately.

Objective: To assess the knowledge, attitude, and practice toward handling of biomedical waste among healthcare workers, before and after an educational intervention.

Materials and Method: An interventional study conducted at a Medical college in Telangana. 100 respondents were taken, which includes nurses, class IV workers, junior residents and doctors. An identical pre and post-training questionnaire was designed which was pre-tested & semi-structured.

Data were collected between June to August. Statistical analysis was carried out by using SPSS version 22 using chi-square test.

Result: Significant improvement was seen about the knowledge of biomedical waste management after the intervention. Bio-medical waste disposal p value was found to be highly significant (p= 0.00001)

Conclusion: Knowledge, attitude, and practice have significantly improved after post intervention given in the form of workshop.

Keywords: Biomedical waste, knowledge, attitude, practice, health care workers.

INTRODUCTION

Biomedical waste is defined as any solid or liquid waste generated during diagnosis, treatment or immunization of human beings and animals or during research that may present a threat of infections to humans. In India, the legislation governing BMW management is called as Bio-Medical Waste (Management and Handling) Rules, 1998 and has been promulgated under Environment (Protection) Act, 1986. There are primarily 4 broad functions for BMW management at source of generation, viz. placement of waste receptacles or bins lined with waste bags at source of generation, segregation of waste, mutilation of recyclable waste and disinfection of waste.

A total of 80% of the waste generated in the hospitals is composed of general waste while the remaining 20% comprises of infectious, toxic or radioactive waste. The waste generated in the hospital has significant health impact not only on the healthcare workers but also on the general public. Improper handling of waste not only poses significant risk of infection due to pathogens like HIV, Hepatitis B & C virus but also carries the risk of water, air & soil pollution thereby adversely affecting the environment and community at large.

Poor management of health care waste potentially exposes health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the environment. It is essential that all medical waste materials are segregated at the
point of generation, appropriately treated and disposed of safely. Trainings of health workers have been proven to be one of the most effective strategies for improving the practices and health behavior, especially when combined with other innovative approaches [9,10]. It has been shown that regular trainings of healthcare workers could improve their practices of waste management at their work places. [11] Trainings of healthcare workers are essential to improve their behavior towards hospital waste management. [12]

**MATERIAL AND METHOD**

**Study design:** Hospital based Cross sectional study

**Study area:** MNR Hospital, Sangareddy

**Study period:** Jun2017 – Aug2017

**Sampling technique:** Stratified random sampling technique.

**Study population:** Total 100 respondents were taken, which includes nurses, class IV workers, Junior residents and doctors.

From each department of hospital four staff members consisting of one doctor, one nursing staff, one junior resident and a class IV worker were selected randomly.

An identical pre and post-training questionnaire was designed which was pre-tested & semi-structured and also validated by a pilot survey. They were administered to the above mentioned staff.

Prior permission from the concerned authorities and oral consent from the respondents was obtained.

Health care workers were administered the pre-tested questionnaires and were asked to answer to the best of their knowledge and practice.

After pretest questionnaire, a workshop was conducted by the department of community Medicine about biomedical waste management.

At the end of the workshop the post test was conducted. Both the pre and post-test questionnaire were evaluated. The participants were divided according to their departments. For 1 week workshop was conducted as per availability of health care workers

**RESULTS**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>45</td>
</tr>
<tr>
<td>26-30</td>
<td>20</td>
</tr>
<tr>
<td>31-35</td>
<td>15</td>
</tr>
<tr>
<td>36-40</td>
<td>5</td>
</tr>
<tr>
<td>&gt;41</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>Male</td>
<td>37</td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 shows most of health care workers belonging to >41 yrs age group

**Table no 2: Pre and post test evaluation of health care workers**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>X² value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aware</td>
<td>Unaware</td>
<td>Aware</td>
<td>Unaware</td>
</tr>
<tr>
<td>Health hazards due to improper Bio-medical waste management</td>
<td>75</td>
<td>25</td>
<td>91</td>
<td>9</td>
</tr>
<tr>
<td>Segregation of Bio-medical waste</td>
<td>36</td>
<td>64</td>
<td>95</td>
<td>05</td>
</tr>
<tr>
<td>Color coding system</td>
<td>55</td>
<td>45</td>
<td>94</td>
<td>6</td>
</tr>
<tr>
<td>Protective measures for staff of Bio-medical waste</td>
<td>83</td>
<td>17</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>Various types of Bio-medical waste produced</td>
<td>63</td>
<td>37</td>
<td>92</td>
<td>8</td>
</tr>
</tbody>
</table>
Table 2 shows pre and post test evaluation of health care workers. There was statistically significant difference between pre and post test evaluation (p<0.05) except for protective measures for biomedical waste management in which it was not significant. (p > 0.05)

**DISCUSSION**

This study was done to assess to the knowledge of Bio-medical waste management and to evaluate impact of intervention training programme. In our study 70% health care workers were aware of biomedical waste management. Another study by Bhagwat et al[13] found that only 70.6% health-care workers were aware of biomedical waste management which is similar to our study. A study by Margabandu and Balasubramaniam[14] among nurses showed that 94% of them had knowledge regarding health-care waste management which is different from this study. The knowledge of Bio-medical waste management was poor in many areas before the workshop may be due to inadequate training. A study conducted by Sain Se et al[15] in a tertiary hospital showed that 85% of the nurses had knowledge about Bio-medical waste management. The effective knowledge might be because of prior training or higher literacy.

In the present study, there is increase in knowledge of health hazards due to improper management of Bio-Medical waste such as transmission of HIV/AIDS, Hepatitis B etc. after workshop and it is statistically significant. Pandit et al[16] in their study found that Paramedical staff had poor knowledge about health hazards which is similar to our study.

The segregation of Bio-medical waste at the point of generation is very important for the disposal of waste. This study showed that the knowledge about segregation of Bio-medical waste was very less (only 36%) among the participants. After training session the knowledge was significantly increased and was found to be statistically significant. The study done by Madhukumar S and Ramesh G[17] at Bangalore showed that 87.5% of the study subjects were in favor of segregation.

The study revealed that more than half (54.92%) of the study subjects were unaware about color coding of Bio-medical waste. After training the awareness was raised to 80.33% and the increase was found to be statistically highly significant. In one of the study by Asadulla et al[18] it was found that only 28.9% of the nurses had complete knowledge regarding color coding and different categories of Bio-medical waste.

The present study observed that nearly half (48.36%) of the participants were not having knowledge about the precautions taken while handling Bio-medical waste. The study also showed that 60% of the subjects did not know about the Bio-Medical waste (Management & handling) rules before the training and the knowledge was significantly increased to 84% after having training and was found to be statistically highly significant. Similar findings were reported in the study conducted in Bhopal by Bathma et al[19] showed that 54.5% of nurses were aware about the existence of BMW management and handling rules 1998 (2012).

**CONCLUSION**

From the assessment of knowledge of categorizing as biomedical waste, all areas were improved. Knowledge regarding the color of bins was good. In addition, with training there was improvement. More focus can be placed in areas where the students are always confused about choosing the right colored bins. Emphasis needs to be placed among health care workers that waste is not mixed up in the end and that great measures are taken to ensure the proper transportation and disposal of the biomedical waste.

**Conflict of Interest** – None

**Source of Funding**- Self
REFERENCES


Evaluation of Knowledge, Attitude and Practice on First Aid Measures among Students

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ABSTRACT

Objective: The main aim of the first aid is to save the life, prevent degradation of the situation and to promote the recovery. The adequate knowledge on first aid can promote the chances of survival of the injured person. This study was conducted to assess the knowledge, attitude and practice of secondary school and intermediate students towards the first aid.

Method: It is a prospective study conducted in randomly selected secondary schools and intermediate colleges of Piler Mandal, Chittoo District, Andhra Pradesh for a period of 3 months) by using a validated questionnaire which consists of 28 questions to assess their knowledge, attitude and practice about first aid. All statistical analyses were performed using Microsoft Excel 2010 and Graph Pad Prism 7.0 software.

Results and discussion: The goal of first aid is to preserve life, prevent further injury and promote recovery. Statistically significant difference was not found in the knowledge (P=0.6204), attitude (P=0.2351) and practice (P=0.9508) among secondary school and intermediate students about first aid measures.

Conclusion: The knowledge, attitude and practice of secondary school and intermediate students on first aid was found to be adequate but still it is the responsibility of each and every school to provide training on first aid measures and also to have fire extinguisher in their school campus.

Keywords: Practice, First aid, Knowledge, Attitude

INTRODUCTION

First aid is the emergency care provided immediately to an injured person by a trained medical or non-medical person till a medical attention is sought[1]. The main aim of the first aid is to save the life, prevent degradation of the situation and to promote the recovery [2]. Often, the first action taken for management of injuries and common illness decides the future course of disease and complication rates [3]. The importance of training persons in first aid at earlier stages of their career is now coming into practice worldwide. Since, Students have the potential for changing the health scenario of the society if properly groomed and educated for healthful living[4,5]. It was mentioned that making the students to learn about first aid with in the schools will probably decrease the cost of saving lives[6]. The adequate knowledge on first aid can promote the chances of survival of the injured person [7]. Since, school is the place where children spent most of their time, by learning the new things and upgrading themselves. Apart from their studies they are involved in many extra-curricular activities which are meant for their physical and mental development in a healthy way. Most common activities in which children involved are bicycle riding, swimming, and playing games. But during these activities the children are most endangered to get injured physically [8,9]. It is stated in a study that 88% injuries in children are physical and almost 20% of those injuries were occurred only during their school hours [10]. The unfortunate incidents occurring at the schools during the extra-curricular activities are leading to serious injuries compared to the non-school incidents [11]. If these injuries are left as such, the state of heath of the child may be worsened [4]. So it is the responsibility of health care professionals to create awareness and conduct training program in schools on first aid to protect the children from worsening of condition which occurs due to
injuries till they seek medical attention. Moreover, it was stated that the proper first aid measures may sometimes result in avoiding the physician consultation. But to provide first aid in a correct way, the provider should have some basic knowledge and experience on it in order to minimize the injury and to save the life. Hence, it is important for each and every individual to have some basic knowledge on first aid in order to save the injured person till the medical consultation is available. According to National Science Advisory Board (NSAB), it is the duty of every individual to learn and practice the first aid. Hence, school is an appropriate place for initiating teaching and training activities on life saving first aid skills. Even though many trainings and awareness camps have been conducted on first aid, people are not ready to assist the injured persons who need medical attention by providing first aid, since they are fear of committing some mistakes while doing first aid measures. On account of first aid significance in school, all the schools should be equipped with the basic facilities to provide first aid. Hence, this study was conducted to assess the knowledge, attitude and practice of secondary school and intermediate students towards the first aid.

METHODOLOGY

Study Design and Data Collection

It is a cross-sectional, comparative study conducted in randomly selected secondary schools and intermediate college of Piler Mandal, Chitoor District, Andhra Pradesh for a period of 3 months (June to August, 2017). The Institutional Ethics Committee of RVS Institute of Medical Sciences approved this study (Approval No: IEC/RVSIMS/2017/01) and also we have taken permission from Piler Mandal Educational Officer to conduct this study. A comprehensive plan of the study was described to the Principal of Secondary School and Intermediate College and their consent was taken prior to discussion with students. Consent was also taken from the students participating in the study. A validated questionnaire which consists of 28 questions (18-knowledge oriented, 5- attitude oriented and 5-practice oriented) was used to assess their knowledge, attitude and practice about first aid. The frequent incidents which need first aid like external bleeding (including epistaxis), choking, snake bite, burns, fits etc., were assessed. 600 Students (300 from secondary school and 300 from intermediate college) were included in this study. The validated questionnaire was issued to the students and sufficient time was given to the students to answer the questionnaire. Verbal consent was obtained from each student during data collection. The confidentiality of the data obtained was assured and the personal details of the student were omitted from the questionnaire. While collection of questionnaire, the students were asked for any unclear ideas in the questionnaire, checked for any unfilled information and education and training regarding first aid was provided to the students.

Statistical Analysis

The collected data was tabulated and analyzed using Microsoft Excel 2010 and Graph Pad Prism 7.0 software. Chi square test and student t-test were used to determine the presence or absence of statistically significant difference wherever necessary. Wherever computed, a P value of less than 0.05 was considered significant; since the confidence interval was maintained at 95%.

RESULTS

The Socio-demographic characteristics of 300 secondary school and 300 inter-college students are shown in Figure 1- 4. The students who are participated in this study have been segregated into four groups based on the class what they are studying which is shown in Figure 1.

![Figure 1: Class Wise Distribution](image-url)
Among parents of 600 students, 39.83 % (239) of parents were literate and 60.17 % (361) of parents were illiterate.

Figure 2: Gender Wise Distribution

Statistically significant difference in the gender was not found between the groups (P= 0.0744)

Figure 4: Parent’s Professional Background- Medical / Non-medical

Knowledge, attitude and practice of the students about first aid measures were evaluated by using twenty eight questions. The results are shown in Table 1-3.

Table 1(a): Evaluation of students’ knowledge about first aid

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes N (%)</th>
<th>No N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secondary</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Q1</td>
<td>278 (92.6)</td>
<td>204 (68)</td>
</tr>
<tr>
<td>Q2</td>
<td>300 (100)</td>
<td>300 (100)</td>
</tr>
<tr>
<td>Q3</td>
<td>261 (87)</td>
<td>172 (57.3)</td>
</tr>
<tr>
<td>Q4</td>
<td>258 (86)</td>
<td>96 (32)</td>
</tr>
<tr>
<td>Q5</td>
<td>87 (29)</td>
<td>84 (28)</td>
</tr>
<tr>
<td>Q6</td>
<td>0 (0)</td>
<td>113 (37.6)</td>
</tr>
<tr>
<td>Q7</td>
<td>133 (44.3)</td>
<td>111 (37)</td>
</tr>
<tr>
<td>Q8</td>
<td>102 (34)</td>
<td>108 (36)</td>
</tr>
</tbody>
</table>

Questions

Q1: Did you ever hear the word ‘first aid’?

Q2: Where did you hear this term ‘first aid’?

Q3: Do you aware of all the things that are present in the first aid box and what for they are used?

Q4: Do you know how to use the INHALER?

Q5: Do you know how to inject insulin to a diabetic
patient?

Q6: Do your school possess fire extinguisher?
Q7: Do you know how to use fire extinguisher in case of emergency?
Q8: Do you know about CPR (Cardio pulmonary resuscitation)?

Table 1(b): Evaluation of students’ knowledge about first aid

<table>
<thead>
<tr>
<th>Questions</th>
<th>Correct N (%)</th>
<th>Incorrect N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secondary</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Q9</td>
<td>78 (26)</td>
<td>172 (57.3)</td>
</tr>
<tr>
<td>Q10</td>
<td>21 (7)</td>
<td>12 (4)</td>
</tr>
<tr>
<td>Q11</td>
<td>19 (6.3)</td>
<td>7 (2.3)</td>
</tr>
<tr>
<td>Q12</td>
<td>175 (58.3)</td>
<td>124 (41.3)</td>
</tr>
<tr>
<td>Q13</td>
<td>90 (30)</td>
<td>78 (26)</td>
</tr>
<tr>
<td>Q14</td>
<td>187 (62.3)</td>
<td>148 (49.3)</td>
</tr>
<tr>
<td>Q15</td>
<td>67 (22.3)</td>
<td>119 (39.6)</td>
</tr>
<tr>
<td>Q16</td>
<td>213 (71)</td>
<td>274 (91.3)</td>
</tr>
<tr>
<td>Q17</td>
<td>300 (100)</td>
<td>300 (100)</td>
</tr>
<tr>
<td>Q18</td>
<td>152 (50.7)</td>
<td>160 (53.3)</td>
</tr>
</tbody>
</table>

**P value: 0.6204**

Questions

Q9: What measure will you take when it is continuously bleeding from an open wound injury?
Q10: How will you stop nose bleeding?
Q11: How will you save if you see any person affecting with fits around you?
Q12: During a snake bite injury, the stings over the injured area should not be removed through the mouth?
Q13: What is the first aid measure for a patient with burns?
Q14: What is the first aid measure for a person with breathing difficulty?
Q15: Which of the following action is called as self-CPR during any emergency conditions?
Q16: What are the first aid measures to be taken for a person with low BP?
Q17: Do you know the ambulance number to be dialed during emergency?
Q18: Do you know standing behind the child encircling the child’s chest by hands and squeezing is the first aid measure for choking child?

Table 2: Evaluation of students’ attitude on first aid

<table>
<thead>
<tr>
<th>Questions</th>
<th>Positive N (%)</th>
<th>Negative N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secondary</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Q1</td>
<td>287 (95.7)</td>
<td>297 (99)</td>
</tr>
<tr>
<td>Q2</td>
<td>282 (94)</td>
<td>298 (99.3)</td>
</tr>
<tr>
<td>Q3</td>
<td>101 (33.7)</td>
<td>85 (28.3)</td>
</tr>
<tr>
<td>Q4</td>
<td>283 (94.3)</td>
<td>296 (98.7)</td>
</tr>
<tr>
<td>Q5</td>
<td>271 (90.3)</td>
<td>296 (98.7)</td>
</tr>
</tbody>
</table>
**P value: 0.2351**

**Questions**

Q1: Do you support that performing first aid is helpful in emergency condition?

Q2: Are you ready to perform first aid for a person during any emergency?

Q3: Don’t you feel tense while performing first aid in any emergency condition?

Q4: Will you show interest in attaining the knowledge about first aid?

Q5: Do you think that it is necessary for everyone to know about the first aid?

**Table 3: Evaluation of students’ practice on first aid**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes N (%)</th>
<th>No N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secondary</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Q1</td>
<td>242 (80.6)</td>
<td>116 (38.6)</td>
</tr>
<tr>
<td>Q2</td>
<td>138 (46)</td>
<td>125 (41.6)</td>
</tr>
<tr>
<td>Q3</td>
<td>224 (74.7)</td>
<td>247 (82.4)</td>
</tr>
<tr>
<td>Q4</td>
<td>124 (41.4)</td>
<td>225 (75)</td>
</tr>
<tr>
<td>Q5</td>
<td>185 (61.6)</td>
<td>188 (62.6)</td>
</tr>
</tbody>
</table>

**P value: 0.9508**

**Questions**

Q1: Have you ever used the first aid kit in your school?

Q2: Have you ever given first aid for burns?

Q3: Have you ever stopped bleeding by pressing over the open wound injury?

Q4: Have you ever performed first aid for fits?

Q5: Have you ever given first aid for nose bleeding?

Statistically significant difference was not found in the knowledge (P=0.6204), attitude (P=0.2351) and practice (P=0.9508) among secondary school and intermediate students about first aid measures.

DISCUSSION

The goal of first aid is to preserve life, prevent further injury and promote recovery. We can achieve this goal by obtaining training in three skills which safeguards breathing, bleeding and bones. The knowledge of students were assessed by using eighteen validated questions which mainly focuses on injuries and events that are common in school where emergency measures are considered essential. Among all knowledge questions, everyone has answered correctly to the seventeenth question implied that both the group of students was aware of ambulance number to be dialed in an emergency situation. Only 4.4 % of students have answered correctly (by making their airway clear and turning them side, with their mouth pointing to the ground) to the eleventh question and 95.6 % of students have given a wrong answer that they should hold a metal object. According to a study conducted by Jayanti S et al, only 15(3.3%) out of 441 students have complete knowledge of providing first aid for fits [17]. The students response rate to the remaining knowledge questions were shown in Table 1(a) & 1(b). This study has demonstrated that students have inadequate knowledge regarding the basic first aid measures to be provided for ordinary events. There is no significant difference in the knowledge of first aid measures among secondary school and intermediate students which was determined by the P value (0.6204). Therefore, the teachers and trainers should educate students in such a way they are knowledge enough regarding first aid measures.
Students’ attitude towards first aid execution and learning were assessed by using five authenticated questions. Majority of the students (both secondary and intermediate) have showed positive attitude to the first, second, fourth and fifth question. The least positive response rate was obtained for the third question (i.e., don’t you feel tense while performing first aid in any emergency condition?). Students should be adequately knowledge and trained to perform first aid, so that they will not feel tense while performing it. A study conducted by Al-khamees et al stated that a strong correlation was found between knowledge and attitude [18]. Significant difference was not found in the assessment of attitude about first aid measures among secondary school and intermediate students which was determined by the P value (0.2351).

In the present study, five questions were included to determine the student’s level of practice regarding practice of first aid for burns, open wound injury, fits, nose bleeding and using first aid kit. Statistically significant difference was not found in the practice of first aid measures among secondary school and intermediate students which was determined by the P value (0.9508). The concept of practice is highly significant especially in the field of life supportive measures. Hence, it is mandatory for all the trainers to impart sufficient practice to the trainees on those supportive skills.

CONCLUSION

The knowledge, attitude and practice of secondary school and intermediate students on first aid was found to be adequate but still it is the responsibility of each and every school to provide training on first aid measures. In addition, every school and college must possess fire extinguisher and first aid kit in their school campus. The limitation is that this study was conducted among students of randomly selected schools and colleges. However, it is responsibility of the school management in educating students on how to identify risks and providing first aid training.

Conflict of Interest: The authors do not have any conflict of interest.

Source of Funding - Self

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Subjective Assessment of Sleep Quality and its Associated Factors among Adult Population in Urban Puducherry

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ABSTRACT

Background: Sleep-related disorders considered are an unmet public health problem. Limited population based studies have been conducted in India. So, this study was undertaken to assess the quality of sleep and its associated factors among adults in an urban area of Puducherry.

Materials and Method: A community based cross-sectional study was conducted among 409 individuals aged 20-60 years from Jan 2014 to April 2015 in urban field practice area of Mahatma Gandhi Medical College and Research Institute, Pondicherry. Multistage sampling was used to select the subjects. A Pretested, Semi-structured questionnaire in local language (Tamil) was administered. Pittsburgh Sleep Quality Index (PSQI) was used to assess the sleep quality. Socio-demographic and other information related to smoking, alcohol, tea consumption, milk consumption before sleeping, physical exercise, any chronic illness was collected from the participants. Percentages, mean and odds ratio were used in analysis.

Results: Majority of study subjects were females (70.2%), The mean age of the participants was 40.8 ± 11.3 years. Prevalence of bad sleep quality (PSQI ≥5) was 47.6%. Widowed, divorced and separated individuals had 3.3 times of getting bad sleep compared to unmarried individuals. Sleep quality was significantly associated with age, hypertension and diabetes.

Conclusion: In this study, the prevalence of bad sleep quality was high. Widows, divorced and separated individuals were at higher risk for sleep disturbances. The hypertensive & diabetic individual had more sleep related problems than normal individual.

Keywords: Sleep quality, Pittsburgh Sleep Quality Index, Public health Problem.

INTRODUCTION

Sleep is a physiological process and its quality is strongly related to individual’s health1. It is a changeable state of reduced consciousness, characterized by altered muscle tone, slowing of brain electrical activity and autonomic changes2. Disturbed quality or quantity of sleep limits the normal mental and bodily functioning2. Lack of sleep has linked with an increased risk of factors like hypertension, diabetes, impaired glucose tolerance and obesity3,4.

Lifestyle, type of work, dietary pattern and stress affects the sleep pattern and results in sleep related disorder (SRD). A sleep related disorder is an alteration in the sleep pattern, which interferes with mental, physical and emotional functioning of a person5. Diagnosis and treatment of SRDs helps in improving the capability of the individuals while preventing hypertension, accidents and psychological disturbances. SRD also impairs quality of life and have been considered “an unmet public health problem”6.

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Globally there is a variation of prevalence of sleep problems ranging from 3.9% to 40%, in different African and Asian countries. The incidence of sleep disturbances among general Asian population ranges from 26.4% to 39.4%. In a study in Karnataka, India, reported rates of sleep related disorders ranged from 20% to 34.2%. Another study in North India in urban area, reported a prevalence of 28% for sleep disorders related to initiation and maintenance of sleep.

Sleep problems can be identified by objective and subjective methods. Subjective quality of sleep can be assessed by administration of questionnaire, clinical interviews and sleep diaries. One of the widely used methods for subjective assessment of sleep is Pittsburgh Sleep Quality Index (PSQI) questionnaire.

Even though the problem is immense, there is paucity of studies related to sleep in the India. Therefore, we undertook the study to assess the quality of sleep and its associated factors among adults in urban Pondicherry.

**MATERIALS AND METHOD**

A Community based cross-sectional study was conducted at Urban Field Practice Area of Department of Community Medicine of MGMCRI, Pondicherry from Jan 2014 to April 2015. A sample size of 409 was calculated based on: 20% prevalence of sleep disorders, 95% confidence interval, 10% non-response rate, 5% absolute error and design effect of 1.5.

The list of houses was obtained from the urban health centre. Of the total 5147 population, 3245 were adults in the age group of 20-60 years. Using probability proportional to size, individual sample size for each of the four urban areas was calculated. Systematic random sampling method was used to select the houses in the respective areas. One adult from each house was selected by simple random sampling. The inclusion criteria were adults of 20-60 years age group residing in selected study area. Individuals who gave written informed consent were included in the study. Houses in which door was locked during three consecutive visits were excluded from the study.

There were four parts of the proforma: **Socio-demographic profile, Sleep-related information (PSQI)** (A PSQI score of less than five is indicative of good sleep quality and score of five or more indicates bad sleep quality), **Measurements** (weight, waist circumference, blood pressure), **Other information** (smoking, alcohol, tea/coffee consumption, milk consumption before sleeping, physical exercise, any chronic illness etc.)

Data collection was done by using semi-structured questionnaire in local language (Tamil). Study was conducted after getting ethical clearance from Institutional Human Ethics Committee (IHEC). Data entry and analysis were done using Microsoft Excel and Epi info 7. Data were presented as mean and, percentages and appropriate statistical test (odds ratio) was applied. P value less than 0.05 was considered statistically significant.

**RESULTS**

Total 409 adults between 20 to 60 years participated in the study, mean age of the participants was 40.8 ± 11.3 years. Most of the participants were Hindu (77.3%) followed by Muslims (9.5%) and Christians (12.7%). Based on the PSQI score, prevalence of bad sleep quality (PSQI score ≥ 5) was 47.7%. Good sleep quality was found in 214 (52.3%) subjects. Mean PSQI score was 1.47±0.50.

It was found that there was increasing odds of getting poor sleep quality as the age increases with significant p-value (<0.001). Widowed, divorced and separated subjects had 3.3 times of getting bad sleep compared to unmarried subjects with significant difference [Table 1].
Table 1: Association of sleep quality with socio-demographic factors

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PSQI Score</th>
<th>Total (n-409)</th>
<th>Odds ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5 (n-214)</td>
<td>≥5 (n-195)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>66(71.7)</td>
<td>26(28.3)</td>
<td>92(22.5)</td>
<td>1</td>
</tr>
<tr>
<td>31-40</td>
<td>69(56.6)</td>
<td>53(55.4)</td>
<td>122(29.8)</td>
<td>1.95</td>
</tr>
<tr>
<td>41-50</td>
<td>45(44.6)</td>
<td>56(55.4)</td>
<td>101(24.7)</td>
<td>3.15</td>
</tr>
<tr>
<td>51-60</td>
<td>34(36.2)</td>
<td>60(63.8)</td>
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<td>4.48</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>70(57.4)</td>
<td>52(42.6)</td>
<td>122(29.8)</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>144(50.2)</td>
<td>143(49.8)</td>
<td>287(70.2)</td>
<td>1.33</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>100(55.2)</td>
<td>81(44.8)</td>
<td>181(44.2)</td>
<td>1</td>
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<tr>
<td>Unemployed</td>
<td>17(54.8)</td>
<td>14(45.2)</td>
<td>31(7.6%)</td>
<td>1.01</td>
</tr>
<tr>
<td>Housewife</td>
<td>97(49.2)</td>
<td>100(50.8)</td>
<td>197(48.2)</td>
<td>1.2</td>
</tr>
</tbody>
</table>

There is no significant difference of Sleep quality with milk/tea consumption, smoking or alcohol consumption [Table 2].

Table 2: Association of sleep quality with smoking, alcohol and tea/milk consumption

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PSQI Score</th>
<th>Total (n-409)</th>
<th>Odds ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5 (n-214)</td>
<td>≥5 (n-195)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea consumption</td>
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</tr>
<tr>
<td>No</td>
<td>20(52.6)</td>
<td>18(47.4)</td>
<td>38(9.3)</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>194(52.3)</td>
<td>177(47.7)</td>
<td>371(90.7)</td>
<td>1.01</td>
</tr>
<tr>
<td>Milk consumption before sleep</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>147(53.6)</td>
<td>127(46.4)</td>
<td>274(67.0)</td>
<td>1.17</td>
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<tr>
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<td>67(49.6)</td>
<td>68(50.4)</td>
<td>135(33.0)</td>
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<tr>
<td>Smoking</td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>196(52.8)</td>
<td>175(47.2)</td>
<td>371(90.8)</td>
<td>1</td>
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<tr>
<td>Yes</td>
<td>18(47.4)</td>
<td>20(52.6)</td>
<td>38(9.2)</td>
<td>1.24</td>
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<td>Alcohol</td>
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</tr>
<tr>
<td>No</td>
<td>206(53.0)</td>
<td>183(47.0)</td>
<td>389(95.1)</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>8(40.0)</td>
<td>12(60.0)</td>
<td>20(4.9)</td>
<td>1.68</td>
</tr>
</tbody>
</table>

There was no significant association of exercise, central obesity and BMI with sleep quality. Total 55% individuals had bad sleep quality in normal weight category compared to 45% in overweight category.[Table 3].

Table 3: Association of sleep quality with exercise, central obesity and BMI

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PSQI Score</th>
<th>Total (n-409)</th>
<th>Odds ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5 (n-214)</td>
<td>≥5(n-195) n(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>114(52.8%)</td>
<td>102(47.2%)</td>
<td>216(52.8%)</td>
<td>0.96</td>
</tr>
<tr>
<td>No</td>
<td>100(51.8%)</td>
<td>93(48.2%)</td>
<td>193(47.2%)</td>
<td>1</td>
</tr>
</tbody>
</table>
Central obesity
(WC-male: >90 cm, female: >80 cm)

Yes 87(49.4%) 89(50.6%) 176(43.0%) 1.22 0.31

No 127(54.5%) 106(45.5%) 233(57.0%) 1

BMI classification

Normal/underweight(<23kg/m²)

45(45%) 55(55%) 100(24.4%) 0.7 0.09

Pre-obese /obese (≥23kg/m²)

169(54.7%) 140(45.3%) 309(75.6%) 1

The odds of having bad sleep quality were two times among the hypertensive individuals than those who were not hypertensive. The risk of having bad sleep quality was four times higher among the diabetics compared to non-diabetics and eight times higher among those who had heart disease compared to those who were not having heart disease [Table 4].

Table 4: Association of sleep quality with chronic illness

<table>
<thead>
<tr>
<th>Chronic disease</th>
<th>PSQI score</th>
<th>Total</th>
<th>Odds ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤5(n-214) n (%)</td>
<td>≥5 (n-195) n (%)</td>
<td>(n-409) n (%)</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>Yes 2.9</td>
<td>&lt;0.001</td>
<td>50(12.2%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No 4.1</td>
<td>&lt;0.001</td>
<td>359(78.7%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>Yes 7.9</td>
<td>0.02</td>
<td>8(2.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No 7.9</td>
<td>0.02</td>
<td>355(86.8%)</td>
<td></td>
</tr>
<tr>
<td>Heart diseases</td>
<td>Yes 213(53.1%)</td>
<td>188(46.9%)</td>
<td>401(98.0%)</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Most of the participants were Hindus (77.3 %), followed by Christians (12.7 %) and Muslims (9.5 %). These figures were comparable to the national data in census 2011. The prevalence of poor sleep quality in this study was 47.7% in 20-60 years age group. Similar results were obtained by Tirgari B et al (57.5%) and Asghari AM et al (37%)16,17. Advanced age is associated with changes in sleep characteristics and structure, with increased difficulties in sleep initiation and maintenance18. In the present study, sleep quality was significantly associated with age, with increase in age, the risk of getting poor sleep quality increased. In a study done by Doi Y et al. among Japanese adults, poor sleep was seen with increase in age among females19.

In present study, poor sleep quality was higher among females (49.8%) compared to males (42.6%) but the difference was not significant. Study done by Asghari A et al and Bidulescu A et al also reported similar results17,20. Another study done by Assaad S et al., among 735 participants of aged 18-25 years in Lebanon, found that males had poor sleep quality compared to females (57.8% Vs. 42.8%) 21.

In present study, subjects who were widowed, divorced and separated had three times higher risk of getting bad sleep compared to unmarried individuals with significant difference. In a study, done by Asghari A et al., mean global PSQI was lower among the unmarried individuals while married, separated and widowed individuals had significantly higher score 17.
No association was observed between sleep quality and tea or coffee consumption. Similar finding was observed in a study done by Velez JC et al. In the present study, sleep quality was not associated with exercise. A study by Chien PL et al., found similar result. Another study done by Velez JC et al., showed no significant difference in sleep quality between those who had physical activity and no physical activity was not significant. Contrary to our finding, in a study by Sherrill DL et al., it was found that the individuals who were physically active had lower incidences of self-reported sleep problems. Another study done by Velez JC et al., showed no significant difference in sleep quality between those who had physical activity and no physical activity was not significant. Contrary to our finding, in a study by Sherrill DL et al., it was found that the individuals who were physically active had lower incidences of self-reported sleep problems. Another study done by Bidulescu A et al., showed that the sleep quality was associated with the physical activity.

In obese people, the compression of the pharynx by the cervical superficial fat mass cause air duct stricture and fat deposition in the tissues of the pharynx which leads to sleep disorders. Obese subjects have difficulty falling asleep and maintaining sleep at night and shorter sleep latencies. Metabolic abnormality leads to hyper arousal at night and hypo arousal during the day. However, contrary to this, in present study, obesity has no association with sleep quality. Contrary to the present study, in a study by Myllymaki T et al., inverse relationship was seen between BMI and sleep duration. A study done by Bidulescu A et al., in Atlanta showed that poor sleep quality was associated with BMI.

The present study showed that the risk of having bad sleep quality was four times higher among the diabetics compared to non-diabetics individuals. In a study done by Rajendran A et al. and Bidulescu A et al found similar result.

The present study showed that hypertensive individuals have two times risk of having bad sleep quality compared to non-hypertensive individuals. A study done by Bidulescu A et al., showed that the sleep quality was not associated with the hypertension. In present study heart disease was also found to be an important factor for bad sleep quality.

Alcohol intake in early stage induces sleep through depressing brain activities, then later its stimulating effects disturbs normal sleep stages. The present study showed that among the individuals who consume alcohol, 60.0% had bad sleep quality, although there was no association between the sleep quality and alcohol.

**CONCLUSION**

In this study, the prevalence of bad sleep quality was high (47.7%). It was found that as the age increases, the sleep related problem increases. Widowed, divorced and separated subjects had higher risk. Therefore, the priorities should be the early identification of sleep disorders and strengthening of intervention that address the various determinants of the sleep disorders. Sleep education program is needed to create awareness among the general population.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Study was conducted after getting ethical clearance from Institutional Human Ethics Committee (IHEC).

**REFERENCES**


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**Institutional Human Ethics Committee (IHEC):** Study was conducted after getting ethical clearance from the Institutional Human Ethics Committee (IHEC).
SAGE study among more than 40,000 older adults from 8 countries across Africa and Asia. SLEEP. 2012;35(8):1173–81
Healthcare Providers Views on Husband-Participation in Maternal Healthcare

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ABSTRACT
This research paper analyzes the healthcare providers’ views on husband-participation in maternal healthcare services. This paper divided into three sections. Firstly, the paper looks into roles and responsibilities of health care providers (doctors, ANMs and ASHA workers) in maternal healthcare services. Secondly, the health providers’ views on husband-participation in maternal healthcare. Lastly, the paper concludes and suggests by emphasizing the significance of improving the husband-participation in maternal healthcare of their wives and newborn child.

Keywords: - Maternal health, Healthcare providers, Ante Natal Care, Natal care and Post- Natal Care.

INTRODUCTION

Maternal health is a crucial concept in women’s health; it is related to pregnancy and child birth. Quality health care in these stages is the right of both the woman and the unborn child. Maternal healthcare is one of the components of reproductive health programme in India. Maternal Health was among one of the Millennium Development Goals (MDG-5); to improve health of mothers and reduce the maternal mortality to 109 death/per one lakh live births by 2015 was being targeted. ‘Ensure healthy lives and promote well-being for all ages is one of the Sustainable Development Goals (SDG-3); to reduce the global maternal mortality ratio to less than 70 death/per one lakh live births by 2030 is being targeted’7. The Maternal Mortality Rate (MMR) is 167 deaths per one lakh live births in India8. According to World Health Organization every year, 45,000 women in the country die from pregnancy related complications, which is more than in any other country9.

Women, in patriarchal social structure like India, are often considered vulnerable. There are multifarious dimensions of this gender based vulnerability – since ancient and medieval times, women have been discouraged to acquire education and access other developmental avenues.

In patriarchal structures of Indian society, women often have been found caught up in multiple and repeated pregnancies that take heavy toll of their health and life10.

Attention to men’s involvement in reproductive health received a force following the Programme of Action forged at the 1994 International Conference on Population and Development (ICPD) (Cairo Programme of Action, September 1994). Under the programme, focus was on men play a key role to promote gender equality and to encourage and enable men to take responsibility for their sexual and reproductive behaviour and their social and family roles. The programme also highlights the women’s health and safe motherhood emphasizing on education to engage men’s support for maternal-health and safe motherhood; all countries are urged to seek changes in high-risk sexual behaviour and to devise strategies to ensure that men share responsibility for sexual and reproductive health11.

Husband’s participation in the maternal health care of women is very essential for healthy mother and healthy child. It may be preventable strategies for maternal death in India. In traditional societies, generally, men or husbands have been uninformed about the pregnancy concerns of the wife and as well as maternal health is always considered the women’s domain in Indian society.

There is need to develop ways and means to implement the ICPD+5 recommendation which urges Governments and their partners to “support public health education to create awareness of the risks of pregnancy, labour and delivery and to increase the understanding of the respective roles and responsibilities of family members, including men, as well as of civil society and Governments, in
promoting and protecting maternal health”.

Husband-participation in maternal health care of women is helpful in terms of providing better health care and to ensure the institutional delivery of pregnant women. The health system and health professionals are showing the need to increase the couple counseling about the maternal health care and educate the husband about each and every aspect of care of maternal health. It may be helpful to realize that husband participation ensure the better health of mother and new born child care. Now we need to realize that maternal health care is not the domain of women only but it is a joint effort of both husband and wife.

**RATIONAL OF THE STUDY**

Most of the studies did not reflect the healthcare providers’ views on husband-participation in maternal healthcare. Whereas various studies revealed that behaviour of health care staff members become one of the barrier for not promoting husband-participation in maternal healthcare due to unwelcome behaviour toward them. There is need to understand healthcare providers needs and challenges face in the healthcare system especially related to maternal healthcare services. This study just gives idea about the healthcare providers’ viewpoint on husband-participation in maternal healthcare. But due to small sample size the study cannot be generalized. For this reason there is need to conduct more research studies which reflect the healthcare providers’ views and how health care system positively can incorporate husband-participation in maternal healthcare services. This is automatically increase health status of pregnant mothers and their children in the society.

**OBJECTIVES**

The objectives of the study were

To understand roles and responsibilities of healthcare providers (ASHA Workers, ANMs, Nurses and Doctors) in maternal healthcare services.

To study the healthcare providers’ views on husband-participation in maternal health care services.

**MATERIAL AND METHOD**

To achieve the above objectives, the present study adheres to qualitative research. The study was descriptive research design. Sample size consisted of 8 healthcare providers (2 ASHA Workers; 2 ANMs; 2 Doctors and 2 Nurses) from dispensary and hospital of Delhi were selected by using non-probability method of purposive sampling technique for the purpose of interview. Data were collected through in depth interview schedule.

**FINDINGS**

**Role and Responsibilities of Healthcare Professionals:**

ASHA workers revealed that the role and responsibilities is of providing the maternal health care services to community women. They shared that the roles and responsibilities are- registration of pregnant women in dispensary, some time pregnant women themselves report or contact the ASHA workers, issuing the antenatal check-up card, facilitate the antenatal check-ups visits, accompany the women for hospital delivery or motivate for birth of new born child in hospital, ensure immunization of mother and their child, after the delivery they conduct home visits, discuss about various methods of family planning and follow-up the cases if birth took place at home.

ANMs (health providers) revealed that the role and responsibilities is to provide maternal health care services to women which includes- antenatal check-ups facilities, child immunization, aware about various methods of family planning and their importance and make the referral service (depend upon choice of women in which she want to birth their child) for institutional delivery. They also conducted three home visits if the delivery took at home and ANMs suppose to conduct home visits within two days of delivery. Incase delivery took place in hospital than ANMs suppose to conduct home visits within one week of delivery. During the home visits they discuss about care of mother and child and importance of breast feeding for new born. Second home visits conduct within fourteen day which focuses on family planning and child immunization. Last home visits conduct within one month of child birth by ANMs.

Further, doctors mentioned that during the natal (delivery) stage works include- registration of pregnant women, all medical treatment and check-ups which is required, time to time check the women health condition after delivery, counseling on family planning and identification of medical problems.

Further, the nurses discussed that the role and
responsibilities in terms of providing the antenatal check-ups services for pregnant women. For this registration of pregnant women, distribution of medicine, medical check-ups such as injection and counseling about pregnancy care, breast feeding and family planning.

**Husband-Participation in Maternal Health Care: Observation and Experiences of healthcare providers**

**Antenatal Care Services**

Both the ASHA workers and Auxiliary Nurse Midwives were told that in earlier times, husbands hardly participated in maternal health care of their wives. ASHA workers expressed that now a days more and more men are actively participating in the same. They also informed that in joint families, husband-participation is still less as compared to nuclear families, where they play crucial role in caring for their pregnant and lactating wife. In joint families mother-in-laws and other relatives take up major responsibilities of caring for pregnant women.

Further, doctors and nurses from the government hospital cited that fewer men accompany their wife during the antenatal check-ups. Men are not allowed to come with their wife during the antenatal check-ups. Nurses also do not interact with the husband because as they are not allowed entering the antenatal check-ups services premises.

**Natal Care Services (Delivery Time)**

Both ASHA workers and ANMs stated that most of the husbands accompanied their wives during the delivery. The possible reason for husbands is to ensure the economic support and other requirement which is needed during delivery of wife in hospital.

Whereas both the doctors revealed that fewer husband and more family members accompanied the pregnant women. They did not had much interaction with husbands of pregnant wives because they were busy in arranging medicines, blood, report, etc., required at that time. One of doctor said, “In most of the cases pregnant wives had very low anaemia problem which make her delivery very risky for her life. Husband did not care about life of their wife. Some of husband did not willing or prepare to donate own blood for their wife”.

Another case shared by doctor, “one of case in which no family member accompanied the pregnant woman during the delivery. It was second pregnancy of the woman and only her five year old child is with him. All the arrangement did by doctors’ team”. Above discussed cases by doctors revealed that lack of family members and husband support during the delivery time of women in hospital.

**Postnatal Check-Up (After Child Birth)**

**Immunization of Child**

ASHA workers mentioned that the fewer men accompanied their wife during the child immunization. Because they think it is responsibility of mother to provide child immunization. Now day’s improvement in child immunization women were more concerned for child immunization.

According to ANMs mothers’ motivation was necessary for proper utilization of child immunization services (thereby minimizing role of father). Fewer of husbands accompanied their wife during the child immunization. They also stated that the reasons include, it is difficult to those husbands who are engaged in private sectors and daily wagers. They emphasized on significant role of mothers in availing child immunization services. On the other hand, ANMs emphasized that there is no role of fathers in child immunization. But there is need to educate the father about importance of child immunization for his child health. If father do not able to accompany their wife for child immunization but they can ask and remind their wife on the same. Healthcare professional do not realize the importance of husband-participation in child immunization.

**Family Planning**

ASHA workers expressed that condoms as a method of family planning are quite popular among the community people. Its high usage is also due to free of cost availability in the dispensary. ASHA workers need to provide the condom for women during each home visits. Second most popular method of family planning is copper-T. Its high practice is also due to awareness created by ASHA workers among women for usage of copper-T method. For these work ASHA workers gets some money based-incentive to ensure use of copper-T by community women. As health worker ASHA have less chance to talk to husbands of pregnant women on family planning issues and it is therefore easier from them to convince or motivate women for using family planning methods. They further told that in case, women...
decide to undergo tubectomy, their husband accompany them. During the data collection the researcher observed that one of woman wants ASHA worker should talk to her husband on family planning because her husband is not in favour of usage of copper-T. It reflects that ASHA worker themselves do not want to interact with men on such issue. It may be they felt some kind of shyness and hesitance toward talking to husband on family planning issues.

Further, ANMs also expressed that husband role in family planning is very essential for their wife. They also shared that without husband’s consent, no woman ever takes step for family planning. A study by Ravichandran find that wife’s perception of her spouse’s attitude is important as it may help her in her own decision-making. During the data collection, it reflects that most women respondents have take consent of her husband’s for practicing methods of family planning. Husbands’ decision-making plays significant role in usage of family planning by his wives.

ANMs only deal with women for motivating the use of family planning methods. If the husband is not willing to methods of family planning than ANMs conduct the home visits for motivating about use of family planning methods.

Next, doctors mentioned that husbands do not accompany their wife during the postnatal care services. One of doctor said that “if husband engaged in private job and he take one day off from their work then he lose one day money from their salary”. After the six weeks of child birth couple supposes to come in hospital for attending the family planning counseling session. For this most of women did not come to hospital and during that time period women may conceive another child. It can be unfriendly behavior of hospital staff members that a whole day spends on family counseling. Doctor told after child birth they motivate women to use copper-T and they follow. Discussion on options of family planning methods does not take place.

**Significance of Husband-Participation in Maternal Health Care**

All the ASHA workers, doctors and nurses agreed that husbands should participate in maternal health care of their wives as they are main decision maker related to wives’ health and do have say in the family matters. Husbands’ support is essential at all levels for improvement in health condition of their wives.

One of the ANM even told that if family support is not there with women then the husband’s participation is required while another ANM does not feel the relevance of husband-participation in maternal health care services of their wife.

The analysis reveals that almost of all the health care professionals want husband should participate in maternal health care of their wife. If husband accompany their wife for ANC visits but doctor not allow them to enter in doctors’ room with their wife. It may be they make their husband (male) less motivated to accompany their next visit or less participation in maternal health care of their wife. How much health setups are open to allow both husband-wife in maternal health care in Indian society?

**CONCLUSION**

Maternal health care is one of the sustainable development goals of the country. The present study revealed that health providers (Doctors and ANMs) and ASHA workers recognized husband-participation in maternal healthcare of their wives. Somehow lack of health set-ups or health institutions did not promote the couple friendly approach during the maternal healthcare services. In India, child bearing and rearing practice always consider the women domain. The present study comes up with various suggestions for improving husband-participation in maternal healthcare. Firstly, government need to develop infrastructure of the health system where they can promote husband-participation in maternal healthcare. Health care providers’ views on husband-participation in maternal healthcare need to be highlighted. Government should work at three level of health system such as primary, secondary and tertiary level. Healthcare providers need to promote the child bearing is not mother responsibility but it is both or joint husband and wife responsibility for ensure healthy mother, children, family and society.

**Ethical Clearance**- Not applicable

**Source of Funding**- Not applicable

**Conflict of Interest** - Nil

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1. Elderly Female in India. New Delhi: Society for Gerontological Research & Helpage India, 1997; p.65-78.


The Role of Alcohol in the Aetiology of Oral Cancer: A Study Done in Southern India

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ABSTRACT

Background: Oral cancer is one of the ten common cancers in the world. Its high frequency in Central and South East Asian countries has been well documented. It is estimated that about 1.98 lac new cases and 98000 deaths occurs worldwide with a mortality rate of 2.1 per lac population. The risk factors for the development of Oral cancers includes alcohol consumption.

Objective: To find the association between Alcohol consumption and oral cancer.

Method: A Case control study done at Kidwai Memorial Institute of Oncology, Bangalore, India. Study subjects included new cases of oral cancer attending the hospital during the study period and equal number controls. Data collection was done by interview method.

Results: Alcohol drinking with an Odds ratio (OR) of 2 was significantly associated with the risk of oral cancer. The OR was 2.4 for arrack drinkers compared to non alcohol consumers. The OR was 3.1 for those who consumed daily and 2.9 for those who consumed thrice weekly. Those consuming more than 120 ml showed an OR 3.84 compared to non drinkers. Those who consumed alcohol for 21- 30 years showed an OR of 2.0 and those who consumed for more than 30 years showed an OR of 2.7 compared to non alcoholics.

Key-words: Alcohol consumption, case control study, Oral cancer

INTRODUCTION

In the developing countries, cancer is one among the ten commonest causes of mortality. Oral cancer is a major problem in India. The estimated incidence is 10.1 cases per lac population for males and 4.3 per lac population in females. 1 This cancer epidemic is due to the combined effect of increased life expectancy and the high or increasing levels of prevalence of cancer risk factors. India has one of the highest incidences of oral cancer in the world. 3 The risk factors for the development of Oral cancers include tobacco smoking, tobacco chewing, oral snuff, chewing betel quid, consumption of alcohol, the presence of potentially malignant oral lesions and poor oral hygiene. 4 There is need for more in-depth studies of various modifiable risk factors in India. This would enable us to evolve appropriate interventions and effective preventive measures to reduce the burden .Thus, the present study would attempt to find the association between alcohol consumption and oral cancer.

METHOD

The Case Control study was conducted at Kidwai Memorial Institute of Oncology (KMIO), located in Bangalore for one year . The study was conducted after obtaining Institutional ethical committee clearance. In this study, the proportion of smokers among controls (0.4) and cases (0.73) was considered to calculate the sample size. The considered level of probability was 5% (a error) and with the β error of 20 % and a permissible error of 0.15. So number of cases were 200 and number of controls were 200. Total sample size was 400.

Definition of a case: Newly diagnosed case of oral cancer of all age groups and all stages of the disease confirmed by biopsy and histopathological report at KMIO. Sources of case
include the hospital, KMIO, Bangalore. For each case, one control was selected. Five year age group matched and sex matched controls were selected. Sources of controls include hospital controls and Patient attendees. Hospital controls included patients with other cancers, other than tobacco related cancers. Patient attendees included healthy attendants of cases either their relatives or friends. Among Cases Terminally ill patients and cases with oral cancer as secondary carcinoma were excluded. Among hospital controls, patients with Tobacco related cancers such as Cancer of Esophagus, Larynx, Lung and Urinary bladder were excluded. Consent was obtained from all the study subjects. Information regarding the socio demographic details, the exposure to risk factors such as alcohol in terms of age at start of habit, type used, dose and duration of exposure were obtained with the help of pretested semi structured questionnaire by interviewing the study subjects.

The following statistical methods were employed to analyze the data. Descriptive statistics, Inferential statistics ie, to evaluate the association between risk factors with the development of oral cancer, Chi square test of significance was employed. To find the strength of association, odds ratio (OR) along with 95% CI (confidence interval) were estimated. A significance level of \( P \leq 0.05 \) was considered for statistical significance.

### RESULTS

Majority of the study population, belonged to the age group of 50-59 years followed by in the age group of 60-69 years. The average age of oral cancer was 54.8 years with a standard deviation of 10.70 years. The study population consisted of 74.0% males and 26.0% females. Hindus constituted the maximum number followed by Muslims and Christians. A higher proportion of Illiterates and unskilled workers were found among cases compared to controls.

A higher proportion of alcohol consumers 86 (43.0%) was observed among cases as compared to the controls, 54 (27.0%). The difference of exposure to alcohol consumption between cases and controls was found to be statistically significant \( (p < 0.001) \). A statistically significant association was found between alcohol consumption and oral cancer. Alcohol consumers showed a 2 fold increased risk for oral cancer (OR= 2.0) compared to non alcoholics. (Table 1)

<table>
<thead>
<tr>
<th>Alcohol consumption</th>
<th>Cases No. ( %)</th>
<th>Controls No. ( %)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>86 (43.0)</td>
<td>54 (27.0)</td>
<td>2.0 (1.3 - 3.10)</td>
</tr>
<tr>
<td>No</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>200 (100)</td>
<td>200 (100)</td>
<td></td>
</tr>
</tbody>
</table>

\( (\text{Chi square value} = 11.32, \text{df}=1, p<0.001) \)

\( (\text{OR} = \text{Odds Ratio}, 95\% \text{ CI} = 95\% \text{ confidence interval}, \text{df} = \text{degrees of freedom}) \)

Among various types of alcohol beverages analyzed, arrack drinkers showed highest risk for oral cancer with an OR of 2.4 compared to non alcoholics. This could be due to highest ethanol content in arrack compared to other types. However other types of alcoholic beverages did not show significantly increased risk for oral cancer. (Table 2)

<table>
<thead>
<tr>
<th>Type of alcohol beverage</th>
<th>Cases No. ( %)</th>
<th>Controls No. ( %)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrack</td>
<td>61 (30.5)</td>
<td>32 (16.0)</td>
<td>2.4 (1.49 - 4.0)</td>
</tr>
<tr>
<td>Beer</td>
<td>11 (5.5)</td>
<td>10 (5.0)</td>
<td>1.4 (0.57 - 3.43)</td>
</tr>
</tbody>
</table>
Cont. Table 2. Odds ratios for Oral cancer according to Type of alcohol beverage.

<table>
<thead>
<tr>
<th>Type of Alcohol Beverage</th>
<th>Cases No. (%)</th>
<th>Controls No. (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whisky</td>
<td>7 (3.5)</td>
<td>8 (4.0)</td>
<td>1.1 (0.39 - 3.18)</td>
</tr>
<tr>
<td>Others</td>
<td>7 (3.5)</td>
<td>4 (2.0)</td>
<td>2.2 (0.64 - 7.84)</td>
</tr>
<tr>
<td>Non alcoholics</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 (100)</strong></td>
<td><strong>200 (100)</strong></td>
<td></td>
</tr>
</tbody>
</table>

(Chi square value =14.08, df =4, p< 0.01)

Others included rum, brandy and toddy.

It was evident that, those who consumed alcohol daily had higher risk of developing oral cancer with an OR of 3.1 and those who consumed three times weekly showed an OR of 2.9 compared to never drinkers. However those consuming alcohol weekly, monthly and occasionally did not show significant risk of developing oral cancer. (Table 3)

Table 3. Odds ratios for Oral cancer according to Frequency of drinking.

<table>
<thead>
<tr>
<th>Frequency of alcohol drinking</th>
<th>Cases No. (%)</th>
<th>Controls No. (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>27(13.5)</td>
<td>11(5.5)</td>
<td>3.1 (1.49 - 6.62)</td>
</tr>
<tr>
<td>Three times weekly</td>
<td>16(8.0)</td>
<td>7(3.5)</td>
<td>2.9 (1.16 - 7.35)</td>
</tr>
<tr>
<td>Weekly</td>
<td>17(8.5)</td>
<td>12(6.0)</td>
<td>1.8 (0.83 - 3.95)</td>
</tr>
<tr>
<td>Monthly</td>
<td>11(5.5)</td>
<td>8(4.0)</td>
<td>1.7 (0.68 - 4.52)</td>
</tr>
<tr>
<td>Occasionally</td>
<td>15(7.5 )</td>
<td>16(8.0)</td>
<td>1.2 (0.56 - 2.53)</td>
</tr>
<tr>
<td>Non alcoholics</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 (100)</strong></td>
<td><strong>200 (100)</strong></td>
<td></td>
</tr>
</tbody>
</table>

(Chi square value =15.89, df =5, p< 0.01)

An increasing trend for oral cancer with increase in the quantity of alcohol consumption was observed. Those who consumed more than 60 ml upto120 ml per drink showed an OR 3.49 and those consuming more than 120 ml showed an OR 3.84 compared to non drinkers. However those who consumed ≤ 60 ml did not show increased risk. (Table 4)

Table 4. Odds ratios for Oral cancer according to Quantity of alcohol consumed.

<table>
<thead>
<tr>
<th>Quantity of alcohol consumption (ml)</th>
<th>Cases No. (%)</th>
<th>Controls No. (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 60</td>
<td>6 (3.0)</td>
<td>25 (12.5)</td>
<td>0.3 (0.12 - 0.77)</td>
</tr>
<tr>
<td>61-120</td>
<td>71 (35.5)</td>
<td>26 (13.0)</td>
<td>3.49 (2.09 - 5.84)</td>
</tr>
<tr>
<td>&gt; 120</td>
<td>9 (4.5)</td>
<td>3 (1.5)</td>
<td>3.84 (1.01 - 14.49)</td>
</tr>
<tr>
<td>Non alcoholics</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 (100)</strong></td>
<td><strong>200 (100)</strong></td>
<td></td>
</tr>
</tbody>
</table>
Alcohol consumers who started the habit before the age of 25 years showed an OR 3.2 and those started after 25 years showed an OR 1.2 compared to non drinkers. Earlier the age at start of drinking greater was the risk of developing oral cancer. (Table 5)

**Table 5. Odds ratios for Oral cancer according to Age at start of the alcohol drinking habit.**

<table>
<thead>
<tr>
<th>Age at start of the drinking habit (years)</th>
<th>Cases No. (%)</th>
<th>Controls No. (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=25</td>
<td>53 (26.5)</td>
<td>21 (10.5)</td>
<td>3.2 (1.84 - 5.68)</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>33 (16.5)</td>
<td>33 (16.5)</td>
<td>1.2 (0.74 - 2.19)</td>
</tr>
<tr>
<td>Non alcoholics</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>200 (100)</td>
<td>200 (100)</td>
<td></td>
</tr>
</tbody>
</table>

(Chi square value =18.25, df=2, p< 0.001)

A significant dose response relationship was observed for duration of drinking alcohol with oral cancer. The risk of developing oral cancer increased after the duration of 20 years i.e. those who consumed alcohol for 21-30 years showed an OR of 2.0 and those who consumed for more than 30 years showed an OR of 2.7 compared to non alcoholics. It was inferred that cancer risks increased as the duration of habit increased after duration of 20 years. (Table 6)

**Table 6. Distribution of cases and controls with regards to Total duration of habit of alcohol consumption.**

<table>
<thead>
<tr>
<th>Total duration of habit of alcohol consumption (years)</th>
<th>Cases No. (%)</th>
<th>Controls No. (%)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=20</td>
<td>22 (11.0)</td>
<td>18 (9.0)</td>
<td>1.5 (0.80 - 3.05)</td>
</tr>
<tr>
<td>21-30</td>
<td>36 (18.0)</td>
<td>23 (11.5)</td>
<td>2.0 (1.12 - 3.57)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>28 (14.0)</td>
<td>13 (6.5)</td>
<td>2.7 (1.36 - 5.55)</td>
</tr>
<tr>
<td>Non alcoholics</td>
<td>114 (57.0)</td>
<td>146 (73.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>200 (100)</td>
<td>200 (100)</td>
<td></td>
</tr>
</tbody>
</table>

(Chi square value =12.85, df=3, p< 0.005)

**DISCUSSION**

Oral cancer is any cancerous tissue growth located in the mouth. It may arise as a primary lesion originating in any of the oral tissues, by metastasis from a distant site of origin, or by extension from a neighboring anatomic structure, such as the nasal cavity or the maxillary sinus. The most common oral cancer is squamous cell carcinoma, originating in the tissues that line the mouth and lips. Oral cancer most commonly involves the tissue of the lips or the tongue. It may also occur on the floor of the mouth, cheek lining, gingival or palate. These are malignant and tend to spread rapidly. 5

**ORAL CANCER AND ALCOHOL CONSUMPTION**

Alcohol is an independent risk factor for oral cancer. The risk in consumers of alcohol depends on the type and the amount consumed. Alcohol may promote carcinogenesis by various mechanisms which
may include dehydrating effects of alcohol on the mucosa increasing mucosal permeability and effects of carcinogen in tobacco, nutritional deficiency and solubilising tobacco. Also liver damage may weaken the immunological status. The alcoholic beverage used commonly in South India are arrack which is locally brewed liquor with 40-50% ethanol. Another locally fermented and distilled sap from palm trees is called toddy with 4% ethanol.

In a study conducted in Brazil, excess risks were observed with increased consumption of wine and cachaca, a distilled sugar cane spirit. The excess risk due to alcohol seemed to reach a plateau at a cumulative level of 1000 kg.

A study done in Spain concluded that all measures of alcohol drinking status, amount, duration, and cessation were strongly associated with cancer risk. A statistically significant increased risk of oral cancer was detected among subjects drinking as little as one drink per day. Cancer risks increased steadily and markedly with longer duration of the habit and were statistically significant after 20 years of alcohol consumption. The association with cancer risk was much stronger for drinking of spirits. The risk increased with increasing ethanol content of each type of drink. No statistically significant associations were observed with age at start or age at quitting after adjusting for duration.

In Znaor et al’s study, a significant dose response relationship was observed between the duration of drinking and average daily amount of ethanol consumption. Among all types of alcohol analyzed, arrack drinkers showed the highest risk, the increase of risk being 7 fold. The consumption of western type spirits did not show a significant increase in risk.

In Trivandrum, India, the authors observed that increased risk was associated with increased amount and duration of alcohol consumption. Dose responses were observed for both frequency and duration of drinking.

It was found that, alcohol drinking had significant predisposing effect on oral cancer in males. Among males, those drinking alcohol more than once daily had an OR 3.19 (95% CI 2.28-6.68), and those drinking alcohol for more than 21 yrs had an OR 4.09 (95% CI 2.21-7.51) when compared to never drinkers. There was a significant reduction in risk associated with late age at starting the habit among males.

A study by Balaram et al, showed a significant trend of increase in oral cancer risk with increasing number of drinks per week (p=0.01). Among the alcohol beverages the highest consumed was toddy, a locally fermented and distilled sap from palm trees. Neither age at start of drinking nor cessation of the habit were related to oral cancer risk.

A Case-control study in Shenyang, Northeastern China by Su et al, with 101 cases and 101 age & sex matched controls, concluded that, men who drank alcohol were at a significantly higher risk for oral cancer, relative to nondrinkers. In men, the risk significantly increased with increasing consumption of alcoholic beverages.

Rosenquist et al, found that, the cases reported a higher consumption of alcohol than the controls. More than 350 g of alcohol per week (OR 2.6; 95% CI 1.3-5.4) was found to be dose-dependent risk factor.

In the study done by Huang et al, the authors examined alcohol concentration and the oral cancer risk in Puerto Rico. Heavy consumers of liquor had strongly increased risks of oral cancer (odds ratio = 6.4) beer/wine showed only modest effects. Among liquor drinkers, risks were consistently greater for those who drank straight (undiluted) liquor than for those who usually drank mixed (diluted) liquor (odds ratio = 4.0).

CONCLUSION

Alcohol drinking was significantly associated with the risk of development of oral cancer. Earlier the age at start of habits, greater was the risk. The risk increased as the dose and the duration of the risk factors increased in a dose dependent relationship. The risk factor is highly amenable for primary and secondary prevention. Adherence to the restrictions on alcohol advertising and promotion, Intensive information education communication activities on harmful effects of alcohol to the public is very important.

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Conflict of Interest: None

Ethical Approval: Obtained
REFERENCES


Incidence and Implications of Outpatient Care among the Vendors Employed in Punjab

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ABSTRACT

Ninety percent of the families earn their livelihood from the informal sector and this sector contributes to two-fifths to the GDP of the country. But a large number of workers in informal live and works under unhygienic conditions and do not get health care benefits. Keeping this in mind, the present study examines the economic burden of illness among the vendors. The study was based on the primary data collected form the three urban districts of Punjab: Amritsar, Jalandhar and Ludhiana. Analysis of data has been done with the help of frequency, percentage, mean and median. The result shows that 37.6 percent of the vendors suffered from the illness and majority of them utilized healthcare facility for outpatient care. The main reasons of the outpatient care were cold/cough and cold/fever. Majority of the respondents visited chemist shops followed by government hospitals, RMP/Local doctor, private hospital, private clinic, Hakim/faith healer and homeopathic for outpatient. The mean and median expenditure on treatment was ₹437.84 and ₹90 respectively, while mean and median money loss to the respondents was ₹826.92 and ₹400 respectively. The various copying mechanisms to meet healthcare burden were own money followed by help from neighbors, friends, employer and relatives. To sum up, there is an urgent need for public action in building health security into the lives of the poor.

Keywords: Incidence, Direct cost, Indirect cost, Health Insecurity.

INTRODUCTION

Health status of the country is the important flagpost to evaluate the success of the state policy. Health of the individuals of the country impacts the growth of the nation in a very material sense. It was estimated that the differences in the growth performance of many countries can be attributed to the health status of their population. Theoretical work as well as empirical evidence clearly shows the positive linkages between the good health and the economic development. The association between poverty and ill-health reflects causality running in both the directions. Poor people are thus caught in a vicious circle: poverty breeds ill-health; ill-health results in impoverishment and indebtedness. Therefore, efforts to combat poverty ought to consider the role of health.

Health security is recognized as an integral element of poverty alleviation programs across the globe. Health security is defined as low exposure to risk, access to health services and ability to pay for medical care and medicine. Health insecurity hampers the ability to work, income and basic human needs. It was documented that a single event of hospitalization accounts 20 to 60 percent of annual income of the household. Illness to poor may place at risk either their physical or mental health on the one hand and financial stability on the other. Illness creates impoverishment through income losses and medical expenses which triggers a spiral impact on the asset depletion, indebtedness and cuts essential household consumption. The burden of the health comprised of the direct as well as indirect costs of healthcare. It has been found that besides the direct expenses incurred by workers in the form of medicines, tests, travel charges, etc. the indirect costs associated with illness such as loss of wages added
to the burden of households\textsuperscript{17,18}. Households have to adopt different coping strategies which ranged from selling added resorted ranged assets, borrowing, to cost prevention strategies like ignoring illness and non-treatment. These coping strategies have an adverse effect on the welfare and livelihood of the household. This added to the insecurities of the informal sector households which survive on low wages and uncertain income opportunities\textsuperscript{19}.

Therefore evidence on the economic cost of illness is essential to evaluate the extent of health insecurities. Keeping this in mind the present paper measures the direct and indirect cost of the illness. To accomplish the objective, the paper has been divided into five broad sections. Section I introduces the types of healthcare cost and its implications. Section II deals with materials and methods adopted in the present study. Section III explained the empirical findings. Section IV concludes the discussion along with policy implications.

**MATERIAL AND METHOD**

The study was based on the primary data collected from Punjab. Data has been collected from the three urban districts of Punjab namely Amritsar, Jalandhar and Ludhiana. For the collection of data a structured questionnaire has been prepared. The respondents of the study were 210 vendors selected from three districts of Punjab (Amritsar= 70, Jalandhar=70 and Ludhiana =70). In the present study, workers employed in the informal sector were selected due to the fact that they are more prone to illness and at the same time due to low and irregular nature of income are unable to pay for illness. The respondents within the districts were selected randomly. The economic burden of illness has been analyzed with the help of frequency, percentage, mean and median.

**FINDINGS**

Table 1 shows the demographic profile of the respondents. It was found that the respondents of up to 30 years were 27.6 percent, 31-40 years 21.0 percent, 41-50 years 27.6 percent, 51-60 years 16.2 percent and 60 years & above were 7.6 percent. Majority of them falls under annual income group of \(\text{Rs} 50001-\text{Rs} 1,00,000\). About 78.6 percent of them were married, majority of them were Sikh followed by Hindu. Majority of the respondents were above primary but up to secondary followed by illiterate, up to-primary, without formal education, senior secondary, graduation and post-graduation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent (N=210)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>94.8</td>
</tr>
<tr>
<td>Female</td>
<td>5.2</td>
</tr>
<tr>
<td>Age (in years)</td>
<td></td>
</tr>
<tr>
<td>Up to 30 years</td>
<td>27.6</td>
</tr>
<tr>
<td>31-40 years</td>
<td>21.0</td>
</tr>
<tr>
<td>41-50 years</td>
<td>27.6</td>
</tr>
<tr>
<td>51-60 years</td>
<td>16.2</td>
</tr>
<tr>
<td>60 years and above</td>
<td>7.6</td>
</tr>
<tr>
<td>Annual Income</td>
<td></td>
</tr>
<tr>
<td>Up to \text{Rs} 50000</td>
<td>9.0</td>
</tr>
<tr>
<td>\text{Rs} 50001-\text{Rs} 1,00,000</td>
<td>69.5</td>
</tr>
<tr>
<td>\text{Rs} 1,00,001-\text{Rs} 1,50,000</td>
<td>19.5</td>
</tr>
<tr>
<td>\text{Rs} 1,50,001-\text{Rs} 2,00,000</td>
<td>1.9</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>17.1</td>
</tr>
<tr>
<td>Married</td>
<td>78.6</td>
</tr>
<tr>
<td>Divorce</td>
<td>1.0</td>
</tr>
<tr>
<td>Widow</td>
<td>3.3</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td>Sikh</td>
<td>61.0</td>
</tr>
<tr>
<td>Hindu</td>
<td>30.5</td>
</tr>
<tr>
<td>Muslim</td>
<td>6.2</td>
</tr>
<tr>
<td>Christian</td>
<td>2.4</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>21.4</td>
</tr>
<tr>
<td>No formal education (but can read &amp; write )</td>
<td>6.2</td>
</tr>
<tr>
<td>Up to primary (Class 5)</td>
<td>20.0</td>
</tr>
<tr>
<td>Above primary, up-to secondary</td>
<td>41.4</td>
</tr>
<tr>
<td>Senior secondary school</td>
<td>4.8</td>
</tr>
<tr>
<td>Graduate</td>
<td>3.3</td>
</tr>
<tr>
<td>Post graduate</td>
<td>2.9</td>
</tr>
</tbody>
</table>

*Source: Author’s Calculation Based on Primary Survey*
Table 2 shows that 37.6 percent of the vendors suffered from the illness and the main reasons of the outpatient care were cold/cough and cold/fever. The results of self-reported severity shows that 45.0 percent of the vendors stated illness was not serious, 31.6 percent stated that illness was quite serious and only 11.4 percent stated that illness was very serious.

Table 2: Distribution of the Respondents by Type and Severity of Illness

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Illness</td>
<td></td>
</tr>
<tr>
<td>Cold/Cough</td>
<td>38.0</td>
</tr>
<tr>
<td>Cold/Fever</td>
<td>27.8</td>
</tr>
<tr>
<td>Headache</td>
<td>3.8</td>
</tr>
<tr>
<td>Wound</td>
<td>7.6</td>
</tr>
<tr>
<td>Malaria</td>
<td>2.5</td>
</tr>
<tr>
<td>Typhoid</td>
<td>2.5</td>
</tr>
<tr>
<td>Stomach related problem</td>
<td>0.0</td>
</tr>
<tr>
<td>Cholera</td>
<td>5.1</td>
</tr>
<tr>
<td>Breathing problem</td>
<td>5.1</td>
</tr>
<tr>
<td>Chicken pox</td>
<td>3.8</td>
</tr>
<tr>
<td>Dehydration</td>
<td>1.3</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>0.0</td>
</tr>
<tr>
<td>Gastric problem/ Acidity</td>
<td>1.3</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Severity of Disease

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not serious</td>
<td>45.0</td>
</tr>
<tr>
<td>Quite serious</td>
<td>31.6</td>
</tr>
<tr>
<td>Very serious</td>
<td>11.4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

From table 3 it was found that 93.7 percent of vendors utilized health facility for the outpatient care. It has been found majority of the respondents visited chemist shops followed by government hospitals, RMP/Local doctor, private hospital, private clinic, Hakim/faith healer and homeopathic for the treatment. It has been observed that 67.6 percent of the respondents find difficulty in the accessibility of the healthcare facility and the mean and median distance covered to visit health facility was 3.42 km and 3.00 km respectively. Those who have not utilized the healthcare facility stated the main reason was could not get away due to work, minor complaints do not call professional assistance and did not had money.

Table 3: Distribution of the Respondents by Utilization and Access to Health Facility

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you taken treatment for illness*?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93.7</td>
</tr>
<tr>
<td>No</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of health facility visited</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemist shop</td>
<td>31.1</td>
</tr>
<tr>
<td>Government hospital</td>
<td>23.0</td>
</tr>
<tr>
<td>RMP/local doctor</td>
<td>14.9</td>
</tr>
<tr>
<td>Private clinic</td>
<td>9.5</td>
</tr>
<tr>
<td>Private hospital</td>
<td>14.9</td>
</tr>
<tr>
<td>Hakim/Faith healer</td>
<td>6.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Visited facility was easily accessible?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>67.6</td>
</tr>
<tr>
<td>No</td>
<td>32.4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distance covered to visit health facility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean distance (km)</td>
<td>3.42</td>
</tr>
<tr>
<td>Median distance (km)</td>
<td>3.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reason for not seeking care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Could not get away due to work</td>
<td>40</td>
</tr>
<tr>
<td>Did not have money</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on primary data.

Note: Primary data has been obtained from three districts of Punjab (Amritsar, Jalandhar and Ludhiana).

*: In the two month reference period.
Minor complaints do not call professional assistance 40
Total 100

Any self-treatment taken?
Yes 20
No 80
Total 100

Source: Author’s calculations based on primary data.

Note: Primary data has been obtained from three districts of Punjab (Amritsar, Jalandhar and Ludhiana).

* : In the two month reference period.

Table 4 measures the direct healthcare expenditure and the coping mechanism. It has been found that the mean and median expenditure on treatment was ₹437.84 and ₹90 respectively. 77.9 percent of the respondents paid for outpatient care from their own money, 9.1 percent through neighbors, 7.8 percent through friends, 1.3 percent through employer and 3.9 percent from relatives.

Table 4: Distribution of the Respondents by Healthcare Expenditure and Coping Mechanism

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of money spend on outpatient care</td>
<td></td>
</tr>
<tr>
<td>Mean expenditure on treatment (₹)</td>
<td>437.84</td>
</tr>
<tr>
<td>Median expenditure on treatment (₹)</td>
<td>90</td>
</tr>
<tr>
<td>Coping mechanism</td>
<td></td>
</tr>
<tr>
<td>Own money</td>
<td>77.9</td>
</tr>
<tr>
<td>Borrowed from neighbor</td>
<td>9.1</td>
</tr>
<tr>
<td>Borrowed from friends</td>
<td>7.8</td>
</tr>
<tr>
<td>Borrowed from employer</td>
<td>1.3</td>
</tr>
<tr>
<td>Support from relatives</td>
<td>3.9</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on primary data.

Note: Primary data has been obtained from three districts of Punjab (Amritsar, Jalandhar and Ludhiana).

* : In the two month reference period.

Table 5 reveals the indirect cost of illness and it was found that 15.2 percent of the vendors suffered wage loss due to outpatient care and the mean and median man-days loss was 3.5 and 2.0 days respectively. While the mean and median money loss to the respondents due to outpatient care was ₹826.92 and ₹400 respectively.

Table 5: Distribution of the Respondents by Indirect Cost of Outpatient Care

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Construction Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you take leave / suffer wage loss due to illness*?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15.2</td>
</tr>
<tr>
<td>No</td>
<td>84.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>If yes, how many man days did you loss?</td>
<td></td>
</tr>
<tr>
<td>Mean days</td>
<td>3.5</td>
</tr>
<tr>
<td>Median days</td>
<td>2.0</td>
</tr>
<tr>
<td>How much money did you lose?</td>
<td></td>
</tr>
<tr>
<td>Mean (₹)</td>
<td>826.92</td>
</tr>
<tr>
<td>Median (₹)</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on primary data.

Note: Primary data has been obtained from three districts of Punjab (Amritsar, Jalandhar and Ludhiana).

* : In the two month reference period.

CONCLUSION

From the above results it has been found that the outpatient care imposed a huge financial burden on the respondent. The respondents not only incurred the direct cost rather the indirect also. This shows that 37.6 percent of the vendors suffered from the illness at the time of the survey and the main reason of the outpatient care were cold/cough and cold/fever. While, 93.7 percent of vendors utilized health facility for the outpatient care and majority of the respondents visited chemist shop followed by government hospitals, RMP/Local doctor, private clinic, private hospital, hakim/faith healer and
homeopathic for the treatment. The mean and median expenditure on treatment of illness was ₹437.84 and ₹90 respectively and the respondents adopted different mechanisms to cope up the healthcare expenditure. The respondents also suffered wage loss due to the outpatient care and the mean and median money loss to the respondents due to outpatient care was ₹826.92 and ₹400 respectively. This clearly shows that the indirect burden of illness on the respondents is more than the direct burden of illness. This indicates that respondents were without healthcare benefits and relied heavily on the out-of-pocket healthcare expenditure. This led to tremendous burden on poor household and resulted indebtedness and liquidation of their productive assets. A central focus of the study is that informal sector households without any formal health insurance protection, bears the dual burden of healthcare expenditure as well as loss of income during illness. This is more critical when large proportion of our population is poor and many households were pushed into poverty trap due to catastrophic health expenditure. This widens the health insecurities of the informal sector households which survive on low wages and uncertain income opportunities. This study addressed the key findings to the policy makers to ensure that health safety and financial protection against the impact of illness to informal sector workers. Therefore, deliberate steps must be taken by the government to ensure that health care access is improved and sustained particularly for these income groups.

Ethical Clearance-NA

Source of Funding- Self

Conflict of Interest -Nil

REFERENCES

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Awareness of Swine Flu (Influenza H1N1) among the Rural Population of Shamirpet Mandal, Telangana

Umama Zareen¹, M Surya Durga Prasad²
¹Intern, Mediciti Institute of Medical Sciences, ²Assistant Professor, Community Medicine, School of Medical Sciences, University of Hyderabad

ABSTRACT

Background: Swine flu, being a deadly disease is dreaded all over the world, especially in India which was the third most affected country in the 2009 pandemic. Aims & objectives: To estimate awareness, perception & myths regarding swine flu and identify the sources of information among rural population of Shamirpet.

Materials & method: Cross sectional study was done in February 2015 immediately after an epidemic situation, among randomly selected individuals in a rural population, with a pre-defined questionnaire and data was analyzed using MS excel. Results: 92% of the study population has heard of swine flu. Major source of information being the television and the health care professionals were a source to only 9.2% of the entire study population. 80.8% of the population aware that the route of transmission of H1N1 is via inhalation and 83.2% were aware of use face mask to prevent swine flu. Conclusion: knowledge regarding swine flu is high among the study population as television is the commonest source of information, health care professionals should help in clearing the misconceptions and educate the population especially during epidemics. As swine flu spreads quickly in its early stages, high level of awareness is important for its containment.

Keywords: swine flu, prevention, knowledge, myths.

INTRODUCTION

Swine flu is an alarming disease that is caused by the influenza A virus (H1N1). Initially, H1N1 was a cause of respiratory disease only in pigs and did not affect humans, later, due to close contact it was transmitted from the pigs to human beings. In human beings, this virus infects the lower respiratory tract and causes rapidly progressive pneumonia especially in healthy children, young and middle-aged adults, unlike the other viruses that infect the immunocompromised and old people. Majority of the human population has no pre-existing immunity to it. These outbreaks usually occur in winters. The virus usually spreads from human to human through aerosols, hand to hand transmission by shaking hands and through infected surfaces and rarely from infected pigs to human beings. Its incubation period is 2-3 days (1).

Symptoms similar as in seasonal influenza are present like cough, fever (>100f), headache, sore throat, chills, myalgia, rash, weakness and some have pronounced enteric features. These symptoms may eventually progress to severe influenza and death. Mortality is high in presence of co morbid conditions (2,3). Vaccines against the new strain are developed with safety profile like seasonal flu vaccine and knowledge, attitude and practices of people regarding swine flu is the cornerstone in prevention of virus spread and outbreak(4).

Till date, two pandemics of swine influenza have occurred, one in 1918 and the other one in 2009. The recent 2009 pandemic began in Mexico and then it spread throughout the world killing around 151,700 to 575,400 people (5) Rapid global spread is accounted due to human to human transmission and due to increased frequency of air travel (6). As of present the world is in the post pandemic period and the virus is expected to continue to circulate as a seasonal virus for years to come and vigilance on the part of health authorities remains important (7).

The rural population of developing countries like India is more vulnerable to this disease because of limited access to medical care, undeveloped public
health infrastructure, low socioeconomic and unhygienic conditions, increased population density and insufficient awareness. Henceforth, this study was designed to assess the knowledge, attitude, awareness and myths regarding swine flu among the rural population of Shamirpet, Telangana.

AIMS AND OBJECTIVES

To assess the knowledge, attitude, myths and practices regarding swine flu among the rural population of Shamirpet mandal, RR district, Telangana.

To reveal the sources of information so that planning can be done and necessary interventions in the field of health education can be taken up effectively.

To know the role of health care providers in spreading awareness about swine flu.

METHODOLOGY

Study setting: A population based cross-sectional study was done in the rural community of Shamirpet, Telangana during the month of February, 2015.

Sample size: using systematic random sampling 250 households were selected and one person per house (preferably head of the household) was interviewed. Those people not willing to participate were excluded.

Inclusion criteria: Both men and women who were willing to participate were included in this study.

Data collection and Analysis: After clearance from the institutional ethics committee and after taking written informed consent participants were interviewed using a pretested and structured questionnaire to elicit the knowledge, attitude and practices of the study population. Complete anonymity was maintained and following this a statistical analysis was performed.

RESULTS AND OBSERVATIONS

The overall study population was 250 and out of 250, 111 were males and 139 were females. Majority of them heard about swine flu disease (92%) and only 8% were unaware of swine flu.

Table I. Distribution of Population basing on Awareness of H1N1

<table>
<thead>
<tr>
<th>Awareness status</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware</td>
<td>230</td>
<td>92</td>
</tr>
<tr>
<td>Unaware</td>
<td>20</td>
<td>08</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>250</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table II. Distribution of study population basing on awareness of symptoms of H1N1

<table>
<thead>
<tr>
<th>Aware of Symptoms (yes/No)</th>
<th>Frequency (Each symptom out of 250)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>209</td>
<td>83.6</td>
</tr>
<tr>
<td>Cold</td>
<td>208</td>
<td>83.2</td>
</tr>
<tr>
<td>Cough</td>
<td>206</td>
<td>82.4</td>
</tr>
<tr>
<td>Headache</td>
<td>133</td>
<td>53.2</td>
</tr>
<tr>
<td>Body ache</td>
<td>133</td>
<td>53.2</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>51</td>
<td>20.4</td>
</tr>
<tr>
<td>Vomiting</td>
<td>102</td>
<td>40.8</td>
</tr>
<tr>
<td>Loose stools</td>
<td>76</td>
<td>30.4</td>
</tr>
<tr>
<td>Don’t know</td>
<td>38</td>
<td>15.2</td>
</tr>
</tbody>
</table>

Majority of respondents characterized fever as a symptom of swine flu (83.6%), followed by cold (83.2%), cough (82.4%), headache (53.2%), body ache (53.2%), breathlessness (20.4%), vomiting (40.8%) and loose stools (30.4%). 15% of respondents, don’t know the symptoms of swine flu.

Table III. Distribution of study Population according to route of transmission

<table>
<thead>
<tr>
<th>Route of Transmission (yes/no)</th>
<th>Frequency (each out of 250)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>202</td>
<td>80.8</td>
</tr>
<tr>
<td>Pigs</td>
<td>67</td>
<td>26.8</td>
</tr>
<tr>
<td>Food</td>
<td>40</td>
<td>16</td>
</tr>
<tr>
<td>Water</td>
<td>49</td>
<td>19.6</td>
</tr>
<tr>
<td>Pork</td>
<td>19</td>
<td>7.6</td>
</tr>
<tr>
<td>Mosquitoes</td>
<td>82</td>
<td>32.6</td>
</tr>
<tr>
<td>Houseflies</td>
<td>53</td>
<td>21.2</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td>Don’t know</td>
<td>42</td>
<td>16.8</td>
</tr>
</tbody>
</table>

Most of them (81%) identified inhalation as the route of transmission for H1N1, followed by through mosquitoes (32.6%), through pigs (26.8%), through houseflies (21.2%) and through water (19.6%). 17% of respondents were not aware of any route of transmission of H1N1.
Table IV. Prevention measures applicable to Swine flu

<table>
<thead>
<tr>
<th>Prevention measure</th>
<th>Frequency (each out of 250)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask</td>
<td>208</td>
<td>83.2</td>
</tr>
<tr>
<td>Personal Hygiene</td>
<td>186</td>
<td>74.4</td>
</tr>
<tr>
<td>Fresh food</td>
<td>52</td>
<td>20.8</td>
</tr>
<tr>
<td>Avoiding crowds</td>
<td>116</td>
<td>46.4</td>
</tr>
<tr>
<td>Avoiding handshakes</td>
<td>31</td>
<td>12.4</td>
</tr>
<tr>
<td>Killing pigs</td>
<td>60</td>
<td>24</td>
</tr>
<tr>
<td>Ayurvedic medicine</td>
<td>6</td>
<td>2.4</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>61</td>
<td>24.4</td>
</tr>
<tr>
<td>Unaware</td>
<td>34</td>
<td>13.6</td>
</tr>
</tbody>
</table>

Common preventive measures like use of mask and personal hygiene was known to 83.2% and 74.4% respectively. 46.4% responded that avoiding crowds is an important precautionary measure against swine flu, 20.8% claim that eating fresh food helps prevent swine flu, 24% have belief that killing pigs will stop the spread of the swine flu, 2.4% and 24.4% believe that swine flu can be prevented by Ayurvedic and homeopathic medicines respectively. Only 13.6% were unaware of preventive measures of swine flu.

Table V. Distribution of study population, basing on availability of vaccine for swine flu

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>87</td>
<td>34.8</td>
</tr>
<tr>
<td>Not available</td>
<td>22</td>
<td>8.8</td>
</tr>
<tr>
<td>Unaware</td>
<td>141</td>
<td>56.4</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>100%</td>
</tr>
</tbody>
</table>

Only 34.8% were aware that swine flu vaccine is available for prevention of swine flu and 56.4 % were unaware of availability of H1N1 vaccine and only 1.2% of them had taken it (3 out of 250).

In case of symptoms 34.4% of them are willing to go to a government hospital for treatment while 45.6% said that they will consult in a private hospital and 20% to the local practitioners.
146 (58.4%) of the respondents are scared by swine flu and the main reasons for considering H1N1 as scary is Deadly disease (141, out of 146) and other reasons are no treatment (3) and no vaccine (2). 7.6% of the study population believe that there is a spiritual basis to this disease.

**DISCUSSION**

This epidemiological study is the first of its kind in the state of Telangana in India as per our knowledge. However, a few comparable studies exist that are from other states and other countries.

In this study 92% of the participants are aware of swineflu which is more than that found in similar studies. In similar studies done by Kawanpure et al in Kerala (9) and Jhummon-Mahadnac N et al (10) done in punjab showed 85.2% and 88% respectively. The most common symptom of swine flu known to the respondents was fever (83.6%), whereas cough was known to 82.4% and cold to 83.2%, while in similar study conducted in Kawanpure et al in Kerala (9) showed fever was known as a common symptom to 71.4%, cold and cough to 62.4%.

In this study major source of information for 80% is television which is comparable with the finding of similar study conducted by Sumeet singh et al in Patiala which showed 76% (11).

In the present study, 80.8% of the participants reported respiratory route as the mode of transmission and this finding was lower in other studies done by Kawanpure et al in Kerala showed 56.3% (9), and Jhummon-Mahadnac N et al study in punjab showed 54% (10). Sumeet singh et al study in Patiala showed 54% in Patiala (11) and Chaudhary et al study in Bareilly identified respiratory route as mode of transmission in H1N1 among 77.2% (12).

In this study 83.2% mention the use of facemask as a way of prevention from swine flu whereas personal hygiene which is the commonest measure was known to 46.4%. These findings are comparable to the findings of the study conducted by Kawanpure et al in Kerala showed Face mask and personal hygiene as preventive measures in 70.42% and 31.9% respectively (9). In contrast to our study, a study done by Rubin et al showed face mask and Hand washing as known preventive measures for H1N1 transmission in 24.3% and 87.8% respectively (13).

In present study, 34.8% were aware of availability of vaccine which is less than that found in study done by kawanpure et al in kerala which showed 55.86% were aware of H1N1 vaccine availability (9).

**CONCLUSIONS AND RECOMMENDATIONS**

The government should continue IEC activities through television to create awareness regarding swine flu as it is the commonest source of information. H1N1 vaccine should be advertised and the population should be motivated to take it. The role of health care professionals in spreading awareness was found to be low and as they are closer to the community, they should maximize their efforts in giving health education and in clearing the misconceptions related to swine flu. Measures should be taken by the government to improve the public health infrastructure and facilities and increase accessibility of medical care.

**Source of Funds:** Self

**Conflict of Interest:** Nil

**REFERENCES**


en.wikipedia.org/wiki/Swine_influenza


Factors Affecting Investor’s Perception of Mutual Fund Investment W.R.T Andhra Pradesh

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ABSTRACT

Investment in mutual funds is effected by the perception of the investors. Statement of the problem is ‘size of investors with small savings has been growing rapidly, yet they are having little expertise and they are novice in choosing mutual funds schemes’. Financial markets are constantly becoming more efficient by providing more promising solutions to the investors and some factors influencing success of mutual fund. Hence, there is a need to study investor’s perception regarding the mutual funds. Primary data was collected by canvassing structure questionnaire and collected pertinent data from 632 respondents. The respondents have been selected based on the judgment sampling technique, and sample spread over erstwhile Andhra Pradesh in three regions of Andhra, Rayalaseema and Telengana. Hypotheses have been tested using analysis of variance (ANOVA) and Chi-square. The analysis finding suggest that majority of investors perception about mutual funds and are willing to invest in mutual fund. Most preferred scheme is star rating schemes. The study was conducted during 2011-2015.

Keywords: Mutual funds, Investors, Investments, Perception

INTRODUCTION

There are many investment avenues available in the financial market for an investor. Investors can invest in bank deposits, corporate shares, debentures & bonds, post office saving schemes etc. Generally an investor considers three fundamental factors viz. liquidity, profitability and safety of investment. Universal fact is that, under normal circumstances if one takes more risk he/she gets more return. They may invest in stock of companies where the risk is high and sometimes the returns are high. For retail investors, who do not have the time, expertise to analyze and invest in stock market, mutual funds is a viable investment alternative. This is because mutual funds provide the benefit of cheap access to expensive stocks.

A mutual fund is a collective investment vehicle, formed with the specific objective of raising money from a large number of individuals and investing it according to a pre specified objective, with the benefits accrued to be shared among the investors on a pro-rata basis in proportion to their investment.

According to Securities and Exchange Board of India Regulations, 1996 a mutual fund means “a fund established in the form of trust to raise money through the sale of units to the public or a section of the public under one or more schemes for investing in securities, including money market instruments”.

A mutual fund company is the one that brings together a group of people having common investment objective and invests their money in stocks, bonds, and other securities. Each investor owns units, which represent a portion of the holdings of the fund.

One can make money from a mutual fund in following ways:

Income is earned from dividends on stocks and interest on bonds. A fund pays out nearly all income it
receives over the year to fund owners in the form of a distribution.

If the fund sells securities that have increased in price, the fund has a capital gain. Most funds also pass on these gains to investors in the form of dividends.

If fund holdings increase in price but are not sold by the fund manager, the fund’s shares increase in price. You can then sell your mutual fund units for a profit.

Funds will also usually give you a choice either to receive dividends or to reinvest the same and get more units.

**REVIEW OF LITERATURE**

The available literature to the present study has been reviewed to understand the work done so far by different researchers.

Yamal Vyas (2010) in his research ‘Know How To Invest Successfully In Mutual Funds’, examined the retail investors, he says that, the retail investors have taken great fancy to the systematic Investment Plan and it seems that every middle class household has a SIP investment.

Nanadhagopal, Varadharajan, Ramya, (2012) in their article A Study on the Performance Evaluation of Mutual Funds in India (Equity, Income and Gilt Funds). In this study, three categories were chosen such as Equity, Income and Gilt Funds. Four mutual fund schemes from each category were selected for evaluating their performance during the period 2006-2009. Suggestions given at the end will help the investors to sort out the errors committed by them in making investment decisions.

Satya Sekhar.G.V. (2013) in this article “Role of Indian Mutual Funds in Financial Inclusion” the mutual fund organizations are taking active part in financial inclusiveness and they are promoting investment habit among the investors. In this context, this paper is intended to examine the role of mutual fund organization in financial inclusiveness with reference to performance through public and private sector.

**OBJECTIVES**

The present study is undertaken with the following specific objectives

To assess the perception of investor’s towards mutual fund and factors effecting the investor’s investment decisions.

To identify the problems of investors in investing their money in mutual fund scheme.

To analyze the investors level of fulfillment regarding mutual fund.

4. To examine the pattern of investment in Andhra Pradesh (regions of Andhra, Rayalaseema and Telangana).

5. To study investors preference with regards to mutual fund v/s other investment products.

**RESEARCH METHODOLOGY**

The purpose of this research is to contribute towards a very important aspect of financial services known as Mutual Fund. The investor perception regarding mutual fund investment has been carried out through a questionnaire survey in Andhra Pradesh. Objective behind selecting this, is to find out whether common man knows about mutual funds and their invest in mutual funds and the factors he / she considers while investing in mutual funds.

**Collection of data and sample**

This study is based on only primary data sources. For the studying the perception of investors has been administered of structured questionnaire of the respondents. 632 respondents have been selected for this study, for Andhra Pradesh only. Hypothesis is tested using analysis of variance (ANOVA) and Chi-square The analysis finding suggest that majority of investors perception about mutual funds and are willing to invest in mutual fund. Most preferred scheme is star rating schemes.

**Table 1: Distribution of sample of investor’s regions wise respondents of Andhra Pradesh state**

<table>
<thead>
<tr>
<th>Regions</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra</td>
<td>193</td>
</tr>
<tr>
<td>Rayalaseema</td>
<td>218</td>
</tr>
<tr>
<td>Telangana</td>
<td>221</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>632</strong></td>
</tr>
</tbody>
</table>

*Source: (Field survey 2013-14)*
Total 632 respondents are taken for study in Andhra Pradesh

Table.2 Factors influencing the investing in Mutual funds:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Very important</th>
<th>Percent</th>
<th>Important</th>
<th>Percent</th>
<th>Not important</th>
<th>Percent</th>
<th>Not at all important</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital appreciation</td>
<td>424</td>
<td>65.53%</td>
<td>177</td>
<td>27.36%</td>
<td>13</td>
<td>2.01%</td>
<td>18</td>
<td>2.78%</td>
</tr>
<tr>
<td>Objective of the fund</td>
<td>228</td>
<td>35.24%</td>
<td>338</td>
<td>52.24%</td>
<td>52</td>
<td>8.04%</td>
<td>14</td>
<td>2.16%</td>
</tr>
<tr>
<td>Return on investment</td>
<td>281</td>
<td>43.43%</td>
<td>242</td>
<td>37.40%</td>
<td>81</td>
<td>12.52%</td>
<td>28</td>
<td>4.33%</td>
</tr>
<tr>
<td>Tax benefit</td>
<td>255</td>
<td>39.41%</td>
<td>285</td>
<td>44.05%</td>
<td>73</td>
<td>11.28%</td>
<td>19</td>
<td>2.94%</td>
</tr>
<tr>
<td>Liquidity</td>
<td>227</td>
<td>35.09%</td>
<td>308</td>
<td>47.60%</td>
<td>83</td>
<td>12.83%</td>
<td>14</td>
<td>2.16%</td>
</tr>
<tr>
<td>safety</td>
<td>324</td>
<td>50.08%</td>
<td>239</td>
<td>36.94%</td>
<td>52</td>
<td>8.04%</td>
<td>17</td>
<td>2.63%</td>
</tr>
<tr>
<td>Loan facility</td>
<td>225</td>
<td>34.78%</td>
<td>303</td>
<td>46.83%</td>
<td>81</td>
<td>12.52%</td>
<td>23</td>
<td>3.55%</td>
</tr>
<tr>
<td>Convenience of reinvestment</td>
<td>172</td>
<td>26.58%</td>
<td>313</td>
<td>48.38%</td>
<td>123</td>
<td>19.01%</td>
<td>24</td>
<td>3.71%</td>
</tr>
<tr>
<td>Fund managers background</td>
<td>233</td>
<td>36.01%</td>
<td>264</td>
<td>40.80%</td>
<td>115</td>
<td>17.77%</td>
<td>20</td>
<td>3.09%</td>
</tr>
<tr>
<td>Early bird incentive</td>
<td>126</td>
<td>19.47%</td>
<td>304</td>
<td>46.99%</td>
<td>160</td>
<td>24.73%</td>
<td>42</td>
<td>6.49%</td>
</tr>
</tbody>
</table>

Source: (Field survey 2013-14)

From the above table it can be observed that majority of respondents are given priority to very important factor is ‘capital appreciation’ with 52.54%, important factor is ‘objective of the fund’ with 65.82%, not important factor is ‘early bird incentive' with 24.73% and not at all important factor is ‘early bird incentive’ with 6.49%

DATA ANALYSIS

Table .3 A Study of relationship among regions and choice of mutual funds:

<table>
<thead>
<tr>
<th>Regions</th>
<th>Equity fund</th>
<th>Debt fund</th>
<th>Balanced (Mixed) Fund</th>
<th>Gold ETF</th>
<th>Fund of funds</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANDHRA</td>
<td>54</td>
<td>45</td>
<td>31</td>
<td>22</td>
<td>41</td>
<td>193</td>
</tr>
<tr>
<td>RAYALASEEMA</td>
<td>91</td>
<td>63</td>
<td>10</td>
<td>27</td>
<td>27</td>
<td>218</td>
</tr>
<tr>
<td>TELANGANA</td>
<td>53</td>
<td>24</td>
<td>62</td>
<td>52</td>
<td>30</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>198</td>
<td>132</td>
<td>103</td>
<td>101</td>
<td>98</td>
<td>632</td>
</tr>
</tbody>
</table>

Source: (Field survey 2013-14)

ANOVA test

H0: There is no significant difference in choice of mutual funds among the respondents of three regions

H1: There is significant difference in choice of mutual funds among the respondents of three regions

Calculated F value 0.0947, Degrees of freedom (2, 12), Table value 3.8852 levels of significance 5%

From the table it is clear that calculated value is less than table value. So we accept null hypothesis. Hence we can conclude that there is no significant difference in choice of mutual funds among the respondents of three regions
Table 4: A Study of relationship among region and investment objective:

<table>
<thead>
<tr>
<th>Regions</th>
<th>Capital Preservation and Satisfactory current income</th>
<th>First Priority for Income and Second Priority for Growth</th>
<th>Balanced Preference for Income and Growth</th>
<th>Basically Growth oriented but intends to play it somewhat safe</th>
<th>Maximize growth as income is not Critical and liquidity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANDHRA</td>
<td>21</td>
<td>88</td>
<td>61</td>
<td>17</td>
<td>6</td>
<td>193</td>
</tr>
<tr>
<td>RAYALASEEMA</td>
<td>35</td>
<td>115</td>
<td>40</td>
<td>22</td>
<td>6</td>
<td>218</td>
</tr>
<tr>
<td>TELANGANA</td>
<td>23</td>
<td>70</td>
<td>107</td>
<td>11</td>
<td>10</td>
<td>221</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>79</strong></td>
<td><strong>273</strong></td>
<td><strong>208</strong></td>
<td><strong>50</strong></td>
<td><strong>22</strong></td>
<td><strong>632</strong></td>
</tr>
</tbody>
</table>

Source: (Field survey 2013-14)

ANOVA test

H0: There is no significant difference in investment objectives among the respondents of three regions

H1: There is significant difference in investment objectives among the respondents of three regions

Calculated F value 0.0295, Degrees of freedom (2, 12),

Table value 3.8852 levels of significance 5%

From the table it is clear that calculated value is less than table value. So we accept null hypothesis. Hence we can conclude that there is no significant difference in investment objectives among the respondents of three regions

Table 5: Relationship among regions and knowledge of mutual funds:

<table>
<thead>
<tr>
<th>Regions</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANDHRA</td>
<td>172</td>
<td>21</td>
<td>193</td>
</tr>
<tr>
<td>RAYALASEEMA</td>
<td>173</td>
<td>45</td>
<td>218</td>
</tr>
<tr>
<td>TELANGANA</td>
<td>168</td>
<td>53</td>
<td>221</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>513</strong></td>
<td><strong>119</strong></td>
<td><strong>632</strong></td>
</tr>
</tbody>
</table>

Source: (Field survey 2013-14)

Chi square test

H0: there is no significant difference in knowledge of mutual funds among the respondents in different regions

Calculated chi square value 12.286, Degrees of freedom 2,

Table value 5.991 levels of significance 5%

The null hypothesis is rejected. From the table it is clear that calculated value is greater than table value. So we can conclude that there is significant in knowledge of mutual funds among the respondents in different regions

**FINDINGS**

From demographic profile of respondents, it is found that majority (58.06%) of respondents belongs to the age group of below 30 years and sample is dominated (76.42%) by male respondents, professionals (28.32%) are more in number, majority (62.34%) respondents their qualification is graduation and post graduation, majority (56.42%) of them are married. 48.73% of the respondents have monthly income close to Rs.20000, and 49.21% of the respondents are saving about Rs.2000 per month.

Financial needs of investment, Large (34.65%) of respondents “Depend on investments for income and earning needs” less (5.85%) respondents are “don’t depend on investments”.

Willingness to take risk large (44.94%) number of respondents is “willing to take moderate risk”. The returns are more than market rate of interest they are ready to invest huge amount.

As far as safety is concerned, majority of respondents (82.59%) found to be safe Bank deposits, reasonable
safety investments are (51.27%) Post Office saving schemes, mutual funds and equity shares.

Knowledge of star rating mutual funds. Majority of respondents (73.89%) having knowledge of star rating mutual funds.

**FINDINGS WITH ANOVA AND CHI SQUARE TEST**

A study relationship among regions and investment objective. The hypothesis tested with ANOVA. The test is accepted to null hypothesis. In this test large (43.19%) number of respondents’ objective is ‘first priority income and second priority for growth’. Among the regions large (18.2%) number respondents from Rayalaseema region.

A study relationship among regions and choice of mutual funds. The hypothesis tested with ANOVA. The null hypothesis is accepted. In this test large (31.33%) number respondents are interested ‘equity funds’. Among the regions large (14.4%) number of respondents from Rayalaseema region.

A study relationship among regions and knowledge of mutual funds. The hypothesis tested with chi square. The null hypothesis is accepted. In this test large (81.17%) number respondents are interested ‘yes’. Among the regions Andhra and Rayalaseema respondents are equally same perception.

**SUGGESTIONS**

Based on the analysis and findings of the study, the following suggestions have been made which would help the mutual fund as well as mutual fund investors.

A. For Mutual Fund Companies

To attract the younger generation into the mutual fund industry, mutual fund companies should conduct awareness programmes in colleges, professional college, universities, body of offices, clubs in corporate office, and Government departments etc., it will educate the young investors. Asset management companies and SEBI should organize more seminars, training programmes to investors especially during market fluctuation, economic recession, new products introduced in the market. It reduces the confusion of investors and creates confidence about the market.

Necessary training programmes should be arranged to the financial advisors, agents and distributors it progress investments the training programmes through NISM, NSDL and AMFI. AMFI should take care about the certification of financial advisors and the certificate should be renewed once in 3 years instead of 5 years.

Investors are interested in star rating and equity funds; it will increase risk which may be one of the major factors that discourages investors from committing fresh funds in the market. Hence appropriate risk awareness programme through print and visual media should be provided to improve the risk perception of investors.

Mutual fund companies should launch new and innovative schemes according to the varied needs of the investors. There is a lack of innovative products in the market. People have the capacity to invest and this capacity has to be explored by the mutual funds companies. With the increasing awareness among the retail Investors about capital markets, the mutual Fund Companies should come with innovative schemes to fulfill the requirement of the retail investors.

B. Suggestions to investors’

A Mutual fund investor should be aware of his rights. The agents or financial advisors should make investors aware of their rights as per the SEBI (Mutual funds) regulations & regarding AMFI. A unit holder in a mutual fund scheme governed by the SEBI (Mutual funds) regulations is entitled to:

Receive unit certificates of statements of accounts confirming the title within 6 weeks from the date of closure of the subscription or within 6 weeks from the date of request for a unit certificate is received by the mutual fund.

Receive information about the investment policies, investment objectives, financial position and general affairs of the scheme.

Receive dividend within 42 days of their declaration and receive the redemption or repurchase proceeds within 10 days from the date of redemption or repurchase.

**CONCLUSION**

Investors’ perception is mainly focused on financial investment. Young and small saving investors are interested to invest mutual funds. Young investors are interest in invest star rating mutual funds with equity fund, tax benefit schemes and they are ready to take
moderate risk to get best returns. Therefore mutual fund companies are concentrate star rating schemes volume of business and controlling of risk they suggest to SIP for the development of their investor’s capital appreciation as well as their company’s developments

In today’s volatile financial market environment, mutual funds are looked upon as a transparent and low cost investment vehicle, which attracts a fair share of investor attention helping the growth of the industry. AMCs concentrate fulfilling customer needs. As customers seek trusted advisors, the manufacturer-distributor-customer relationship is expected to be centered not on the sale of products, but for collectively promoting the financial success of customers across all facets of their professional and personal lives. This requires creating a collaborative network of experts in funds management and financial advice, innovative product offerings, efficient service delivery and supporting technology. The mutual fund industry today needs to develop products to fulfill customer needs and help customers understand how its products cater to their needs. Performance of the industry has been strong and it is well-placed to achieve sustainable growth levels. The way forward for the next couple of years for the mutual fund industry would be influenced hugely by the journey undertaken till this point of time and the changing demographic profile of investors.

Conflict of Interest: Nil
Source of Funding: Self
Ethical Clearance: Nil

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Local Governance and Management of Health Care Services: A Community based Case Study in Rural Odisha

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ABSTRACT

Close to 700 million people live in rural areas where the condition of medical facilities is deplorable. In the context of maternal health and reproductive health care, which are the major concerns of human development goals, the important question is about the reach, accessibility, and affordability of these services to the people living in rural areas. As such the well-being of the villagers depends to a great extent on the efficacy of the gram panchayat. In view of the importance of health as a critical input for human development, the present case study aims to look at the different ways the gram panchyat members’ function and involve in areas of health, hygiene and sanitation. A case study of three villages under female and male headed panchayats in Kalahandi district of Orissa is undertaken to understand the involvement of local self-government in the management and delivery of public health services.

Keywords – PRIs, Health Care, Rural Odisha

INTRODUCTION

Improvement in the standard of living and health status of the population has remained one of the important objectives in Indian planning ever since India gained independence. As a part of the community development programme, India was one of the pioneers in health service planning with a focus on primary health care to promote, prevent, curate and rehabilitate health services to entire rural population [1].

Close to 700 million people live in rural areas where the condition of medical facilities is deplorable. In the context of maternal health and reproductive health care, which are the major concerns of human development goals, the important question is about the reach, accessibility, and affordability of these services to the people living in rural areas. As such the well-being of the villagers depends to a great extent on the efficacy of the gram panchayat [2].

Despite the central and state governments initiating measures to involve communities and stakeholders in the provision of basic healthcare services over the years, yet in reality, the community participation of grassroots level bodies has been virtually absent, when it comes to health development and this is where the panchayats play a crucial role.

As primary healthcare is a subject of local self-governments, the gram panchayat is said to be the first level of contact point for the grass root level workers with local governance at the village. Research studies show that deliberations of health issues in the Gram Sabha leads to improved health for both men and women and reduction in their private health expenditures as well [3]. As panchayats are linked to block and district level institutions, they play a decisive role in the programmes for reproductive health, child health and nutrition through community participation [4]. Moreover the involvement of the Gram Panchayat in the selection of the ASHA, holding the untied funds with ANM, leading the Village Health and Sanitation Committee etc. links the panchayat very close to maternal and child health issues.

Role of Women Leaders in Health Services

Women PRI members, participate actively in immunization of children, in organizing health camps, and mobilizing women for accessing health and nutrition services. By working closely with adolescent girls and women, women PRI members prove to be powerful allies for campaigns against early marriage and teenage
Pregnancy as well [3].

Pierson (2013), in his study on gender analysis of health policies in South Asia found that women who gain political power through gender quotas often act as the catalysts for improved health in their societies. Women who have been in positions of power are more likely to promote girl child education and child health in the form of immunization [7]. Beaumani’s study showed that reservation of seats for women in village governments are positively related to a child between the ages of 1 and 5 being fully vaccinated. They also identified a statistically significant relationship between reserved seats for women in village governments and more water taps and hand-pumps. This means that women invested more in terms of funding and delivery of safe drinking water relative to men.

For example, women leaders in Rajasthan and West Bengal invest more resources on drinking water facilities and roads, suggesting that the gender of policymakers has an impact on policy choices. Bhalotra and Clot’s figures (2011) found that seat reservations in India are positively associated with increased investment in MCH, specifically more antenatal visits, higher probabilities of breastfeeding in the first 24 hours following childbirth, giving birth in a public facility, and full immunization by age one. Village women find it easier to approach women representatives about issues that directly impact their lives, as compared to male elected representatives [9].

MATERIAL AND METHOD

In the above backdrop, the present paper documents the findings of a case study research conducted in three randomly selected villages in Koksara block in Kalahandi district of Orissa with an objective to understand the status of health care services and the involvement of local self-government in the same. Two villages were selected from a female headed GP and one village headed by a male sarpanch was purposefully selected for comparison purpose. All the villages under study were tribal dominated villages.

<table>
<thead>
<tr>
<th>Background information of the Villages by No of Households, Sex Distribution of the Population and by Social groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Villages</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Phupgaon</td>
</tr>
<tr>
<td>Birimuhaan</td>
</tr>
<tr>
<td>Kashibahal</td>
</tr>
</tbody>
</table>

Tools of Data Collection

The information was primarily gathered through face to face interviews with the sarpanch, the ward members, anganwadi workers, community leaders, ASHA’s and representatives of women SHG’s to understand the health situation in the village through a well-structured interview guideline keeping in mind the objectives of the study. Key informant interviews, field observations and focused group discussions were held for a deeper understanding of health issues and the involvement of the panchayats. All the information was recorded through voice recorder and later elaborated in the form of notes. The interviews were mostly conversational with movement from one topic to another based on probes.

FINDINGS

Involvement of the Gram Panchayat in Health Care

Panchayat members play a crucial and significant role in monitoring and delivery of public health services. To understand this, interviews were held with the sarpanch, the ward members, the anganwadi worker and other key informants with aspects related to management of illnesses, sanitation, drinking water, maternal and child health and hygiene issues.

It is observed that nearly all the activities concerning health, are monitored by the village health functionaries such as ANM and the ASHA along with the anganwadi workers. Apparently health and hygiene is not prioritized
as development issue requiring any intervention by the gram panchayat members. Hence no initiatives, to organize health/medical camps, were organized by the panchayat at the village level officially. On a personal basis, one of the lady sarpanch, who earlier served as a community health worker, counsels and advises the adolescent girls in the village, on simple measures for disease prevention such as washing hands before serving and eating food and after defecation, maintaining menstrual hygiene etc. Apparently the advices rendered fall into deaf ears as according to her, young girls continue using unhygienic methods during menstruation largely due to lack of awareness about possible health problems.

Awareness about Village Health, Sanitation and Nutrition Committee (VHSSNC)

One of the key elements of the National Rural Health Mission is the constitution of village health, sanitation and nutrition committee (VHSSNC) which is also commonly known as gaon kalian samiti in Odisha, one that addresses issues related to health and takes leadership in providing a platform for improving health awareness among the community. The researcher observed that the village health sanitation and nutrition committee is almost non-functional in the villages under study. The panchayat members could barely speak to the researcher on VHSSNC, and the way they are linked with delivery and management of health services. The village head was unaware of the composition of the members constituting the committee and their responsibilities in delivery of services. The sarpanch was not informed about the meetings neither had any knowledge about the way the money was spent. The ASHA worker in the villages under study was not even aware of the existence of such a committee.

On further probing, it was found that neither a village health plan was developed to assess the health priorities of the community nor a village health register existed at the time, the interviews was conducted. According to the District Level Household and Facility Survey (2007-2008) only 3.3 percent villages in Orissa formed a health and sanitation committee and only in 11 percent villages the pradhan or any of the panchayat member was aware of the untied fund. GP memebrs had limited knowledge about the untied funds and its utilization.

Awareness about Government Sponsored Health Schemes

The gram panchayat members, were poorly informed about government health schemes (central & state). The generally held notion about health was that it is in the jurisdiction of the ANM, and that as panch members, that’s not something they have to focus on. The GP members do not even know much about NRHM and its work. Key informant interviews, show that village panchayat is not involved in a major way in the health development of the village. Although immunization of children and pregnant women has increased over the years, simultaneously there has been continuous ignorance towards hygiene and sanitation issues. Strategies for mobilizing the community and involving health workers, for greater awareness on health and hygiene, has never been initiated. There is hardly any interaction between the village health functionaries and the gram panchayat members. As health is least prioritised, the village health plan is mostly ignored.

Women leaders are more likely than men to bring issues of maternal and child health to the forefront. Strangely the woman sarpanch in the GP under study was least enlightened on these issues. Hence the involvement in terms of monitoring the work related to MCH services was considerably lower.

Concerns of Anganwadi workers

According to the anganwadi workers, the village gram panchayat, showed little interest in the functioning of the AWCs. The difficulties and constraints faced by anganwadi workers are never discussed in gram sabha meetings. The anganwadi workers are often not informed about such meetings as a result they do not bother to inform the panch members about the problems faced in the anganwadi. Apparently there was a disconnect between the village panchayat and the anganwadi workers in the village.

Adolescents health and hygiene

Mobilizing the adolescents on health issues, and personal hygiene has been attempted to some extent by the female sarpanch individually on a personal basis. Training courses on menstrual hygiene and use of sanitary napkins, were also undertaken with the help of a local NGO. It was reported that adolescent girls lack basic knowledge on simple preventive measures for
good health such as washing hands with soap and water before eating and serving food, and after defecation. Panchayats per se have not taken any initiative in this regard. Early age at marriage is still a concern in the area. Girls are married off at an early age of 11 to 12 years, as soon as they attain menarche.

Interviews with the health personnel’s at the community health centre revealed that malnutrition and anaemia are common among young children, adolescents and lactating women in the entire block. Malaria, diarrhoea, tuberculosis are other major illnesses. Neonatal deaths among children occur primarily due to diarrhoea. The panchayat members expressed their concern about this and said that village health workers monitor the cases and accordingly refer them to the closest government health facility. As health is not considered a primary concern for the development of the village, the local government at the village level shows minimal interest in understanding the causes and repercussions of such illnesses for the community.

**Findings from FGDs with village women**

FGDs with community women revealed that panchayat interventions in the area of health and sanitation was virtually absent. Health camps are never organized, neither any discussion on sanitation and hygiene practices conducted in the community. There was a need felt for greater panchayat interventions, along with NGOs to spread awareness among adolescent’s girls and pregnant women about nutrition and ways to prevent anaemia as is commonly prevalent among lactating women in the community. Though ASHA workers actively mobilize the community for ensuring 100 percent institutional deliveries, absence of public transport facility makes it difficult and time consuming to approach government health personnel’s located distantly.

In the opinion of the anganwadi worker, the GP members, rarely take any interest in connection to women and child health issues. There are no formal meetings held with GP members nor is she informed about the meetings. According to her, if the panchayat at the village level is involved in a larger way in issues regarding women and child health, the entire community would benefit. In the absence of health camps and campaigns to generate awareness, on health and hygiene, she expressed her concern by stating that in such situations “how will poor illiterate people will know and learn”.

In the words of one of the female health functionary in the village who has been working there for past couple of years “if the sarpanch take some interest, to see how anganwadis function what difficulties are there , I would feel happier and satisfied”. It was reported that anganwadi workers are burdened with lot of work, with minimal human resources, and the gram panchayat is hardly involved or bothered to ask.

Interviews with the higher development officials revealed that though there is a constant reminder to the gram panchayat members to hold meetings jointly with the village health functionaries and have an health agenda, and have an open dialogue with them on health and hygiene issues, yet such meetings are rarely conducted resulting in poor hygiene and health of the community. Health is not prioritized as development concern. Very few are also aware of the different health schemes and entitles.

**Treatment seeking through traditional healers**

Quacks popularly known as “kabiraj” are first visited for seeking any treatment. Every village has a “devataa” or a “devi” a person who is believed to possess supernatural powers. Such persons are deeply revered and worshipped by the villagers. There is a belief that treatment provided by government doctors free of cost, will not be effective, hence quacks are first preferred for treatment of any illness, before approaching public health providers.

**Open defecation and sanitation practices**

Open defecation is commonly practiced in the villages. Due to scarcity of water and religious reasons the villagers do not favour attached toilet at home. Most of the time the constructed toilet space is used for keeping cattle’s, fodder, and other unusable items. According to the key informants the community do not feel a sense of “owning their toilets” and therefore do not maintain them well. In the words of the sarpanch, open defecation is a practice since ages, which she describes as “abhyas” (practice) that is difficult to give up. Women and girls are hesitant to use toilets attached to their homes. In this context the gram sabhas can play a key role in motivating and encouraging the community to have toilets attached to homes as a sign of good sanitation practice.

**DISCUSSION & CONCLUSION**

Panchayats in the context of the study area are not
empowered with the understanding and mechanisms required for them to play their role in governance of health and enable communities through their leadership to take collective action for the attainment of better health status in the village. Owning to their educational backwardness and lack of awareness rural people in general do not readily accept modern practices and habits related to health and hygiene. Quacks and informal health care providers are initially approached for treatment due to lack of public transport facility leading to unnecessary expenditure.

Sensitizing the GP members towards health, hygiene, and sanitation is imperative to enable them to play a more proactive role in improving community health and hygiene. It is recommended that health camps should be organized once in a quarter in the GP headquarters for addressing the health concerns of the community. Exposure visits to model villages could be one ways to generate awareness and develop a sense of responsiveness and understanding the importance of health and hygiene. Government schemes and interventions will bring a positive impact only when the mind sets are changed. Village Health and Sanitation Committee (VHSC) have to be more proactive in their functioning. A woman sarpanch should be extended all support to execute the key issues of health and sanitation keeping in mind the needs of women and girls and lastly sensitizing the villagers for demanding quality health services especially for women and evolving a gender-sensitive environment in the village is important and requires involvement of the Panchayats in a bigger way.

Note: The author is grateful to National Institute of Rural Development and Panchayati Raj for funding the study. The research has been conducted after necessary clearance from the ethical committee NIRDPR.

Conflict of Interest: Nil

REFERENCES

Incipient Study to Control LDPE Pollution by Streptomyces Werraensis SDJM from Garbage Soil

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ABSTRACT

Low density polyethylene (LDPE), a synthetic polymer plays a key role in day today life, it persist for long time when disposed and cause environmental pollution, potentially harming human life and aquatic habitats. The main aim of the present manuscript is to isolate and identify a potent isolate degrading LDPE from garbage soil and perform analytical studies to check the efficiency of degradation. The degraded LDPE is studied based on DSC, FTIR, GSM and XRD analysis after one month of incubation by Streptomyces werraensis SDJM which has been isolated from garbage soil. In Differential scanning calorimeter (DSC) the melting temperature of the LDPE sample is reduced to 3.78%, in Gram per square meter (GSM) analysis the LDPE sample weight is declined to 17.1%, in X-ray diffraction intensity of absorption is decreased to half of its value when compared to control at 21.4 and 23.5 peaks of angular interval (2θ) and in FTIR analysis the intensity of carbonyl band is decreased at 1000-1800cm⁻¹. Based on analytical results it confirms Streptomyces werraensis SDJM is a potent isolate from garbage soil in degrading LDPE.

Keywords: Streptomyces werraensis SDJM, DSC, GSM, FTIR, XRD, Biodegradation, LDPE

INTRODUCTION

Polyethylene is used in various fields ranging from food industry, pharmaceutical industry, and agriculture etc. There are two varieties of plastics; natural plastic and synthetic plastics. Low density polyethylene, a synthetic plastic is the most common plastic in world wide. Each year, an estimated 500 billion to 1 trillion plastic bags are consumed worldwide (1). Polyolefin or saturated polymers have a broad range of applications. Polypropylene (PP) and polyethylene (PE), expressed as CₙH₂ₙ are most widely used linear hydrocarbon polymers (2). Polyethylene is totally linear and available with varying range of densities from 0.91 to 0.97g/cm³. LDPE has branching at random places leading to low packing of the polymer chains, whereas high density is more linear with minimal branching leading to high packing density (3).

Disposable of LDPE after usage creates huge environmental pollution and health hazards. After their use, these packaging materials are dumped in landfills leading to pollution since they are non-biodegradable under natural environmental conditions (4). These plastics are characteristically inert and are resistant to microbial attack, leading to their accumulation in the environment (5). Disposal of polyethylene through incineration releases toxic chemicals mostly Volatile organic compounds like polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzofurans (PCDFs) and dioxins. These VOC’s are carcinogenic in nature and travels thousands of kilometres in the atmosphere (6).

The biodegradation of plastic waste and the use of microorganisms to degrade the polymers have gained notable importance because of the inefficiency of the chemical and physical disposal methods used for the pollutants, as they causes many environmental hitches (7). Several reports states that microorganisms like bacteria, fungi and actinomycyes able to degrade polyethylene and utilize them as a sole source of carbon (1). There are few fungal species A.niger, A.oryzae, A.japonicus, Penicillium sp., etc associated with degrading materials, but A.oryzae was found to be more dominant among all the fungal isolates in degrading low density polyethylene (8) (Indumathi etal, 2016). The microbial isolates that degrade polyethylene bags were isolated and identified by Monica in 2015 (9), she isolated bacterial,
fungal and actinomycetes species, among all the isolated strains Bacillus cereus, Phoma sp and Streptomyces rochei are more prominent in degrading polyethylene.

Biodegradation of low density polyethylene became challenging to overcome the pollution and protect our ecosystem from deleterious effects. This aims me to investigate and isolate a potent strain Streptomyces werraensis SDJM from garbage soil and check the degradation ability of the organism through various analytical techniques.

MATERIAL AND METHOD

Materials

2.1.1 Low density polyethylene film from Pack worth polymers, India with a density of 0.9140-0.9200 g/ml is selected for degradation studies.

2.1.2 Mineral salt medium (MSM) was prepared as per the composition to provide nutrients for the organism (grams per litre) KH$_2$PO$_4$, 0.7; K$_2$HPO$_4$, 0.7; MgSO$_4$.7H$_2$O, 0.7; NH$_4$NO$_3$, 1.0; NaCl, 0.005; MnSO$_4$.7H$_2$O, 0.001; ZnSO$_4$.7H$_2$O, 0.002; and FeSO$_4$, 0.002.

2.1.3 Low density polyethylene powder (LDPE) with 53-75μm particle size was obtained from Sigma Aldrich Chemical Co (Product of USA) with density 0.94g/ml at 250C.

Sample collection, Isolation and Screening

Garbage soil samples were collected from different garbage dumped sites. Isolation and screening was performed for all the isolated strains and found that Streptomyces species is more efficient in degrading low density polyethylene.

Identification of Streptomyces sps through 16srRNA sequencing

For molecular characterization the actinomycete culture was sent to Yaazh xenomics Pvt Ltd, Chennai. Genomic DNA was isolated using Insta Gene TM Matrix Genomic DNA isolation. 8F (AGAGTTTGATCTGGCTCAG) & 1541R (AAGGAGGTAGCCAGCGCA) universal primers were used to identify 16rRNA and sequencing reactions were performed by ABI PRISM® Big Dye TM Terminator Cycle Sequencing Kits. Further the 16sRNA sequence data was aligned and subjected to blast analysis by NCBI blast similarity search tool. The program MUSCLE 3.7 was used for multiple alignments of sequences. The resulting aligned sequences were cured using the program Gblocks 0.91b. This Gblocks eliminates poorly aligned positions and divergent regions (removes alignment noise). Finally, the program PhyML 3.0 aLRT was used for phylogeny analysis and HKY85 as Substitution model. The identified 16srRNA sequence is submitted in gen bank.

Enrichment of Streptomyces werraensis SDJM

Before degradation low density polyethylene powder was added to Mineral Salt medium at a concentration of 0.1% (w/v) and sonicated for 1hr at 120rpm. After sonication the medium was autoclaved at 120°C, 15lbs pressure for 15 min. MSM medium is cooled and inoculated with Streptomyces werraensis SDJM isolate. The inoculated sample is incubated at 30-35°C for 7-10days.

Analytical techniques to identify biodegradation of LDPE by Streptomyces werraensis SDJM

Disinfected LDPE strips were cut into 10x10cm and added into sterile 100ml of MSM containing flasks. Then enriched Streptomyces werraensis SDJM culture is added into the conical flasks with a volume of 10ml. The flasks were left in orbital shaker at 30-35°C, at 120rpm for one month. After one month of incubation the films were disinfected with ethanol, air dried and analytical techniques like differential scanning, X-ray diffraction, FTIR and GSM were performed to identify the structural and chemical changes of the LDPE. Control was maintained without organism to check the efficiency of degradation by Streptomyces werraensis SDJM.

Differential scanning colorimeter (DSC)

DSC is a method used to measure glass transition, melting temperature and crystallization temperature while a polymeric material is heated or cooled. 0.5mg of sample is weighed in aluminum pans and equilibrated at 30°C in DSC instrument DSC Q20 V24.3 with Ramp 5°C/min and temperature 200°C.

Gram per square meter (GSM)

Gram per square meter (g/m²) is a metric measurement unit of surface or a real density. The unit is often used to measure density or thickness of a paper/LDPE. The density expressed in g/m² is called grammage. The
LDPE sample to be analyzed is placed on the equipment (GSM Round Cutter (PRESTO MAKE)) with a safety lock and a handle applying slight pressure, so that the samples were cut by rotating the handle under pressure. Samples collected by releasing the handle and weighed them accordingly to calculate the GSM.

Fourier transform infrared spectroscopy analysis (FTIR)

The structural changes and in the LDPE surface was investigated using FT-IR spectrometer. For each LDPE film, a spectrum was taken from 400 to 4000 wavenumbers cm\(^{-1}\). The carbonyl and double bond indices were calculated based on the relative intensities of the carbonyl band at different wave numbers specifically at 1,715 cm\(^{-1}\) and the double bond band at 1,650 cm\(^{-1}\) to that of the methylene scissoring band at 1,460 cm\(^{-1}\)(14).

X-ray diffraction analysis (XRD)

The X-ray diffraction patterns of the films were measured with a X-ray diffractometer (D5000, Siemens Diffractometer) which is operated fully automatically using Cu Ka radiation (\(\lambda=1.5418\) Å). The scattered radiation was registered in the angular interval (2\(\theta\)) from 2° to 40°. A current of 30 mA and a voltage of 40 kV were used. All diffraction patterns were examined at room temperature and under constant operating conditions (5).

RESULTS & DISCUSSION

Molecular characterization

The 16S rRNA gene sequence data of the strain SDJM was compared with the Genbank nucleotide data bases. The strain was phylogenetically placed in the genus Streptomyces (Fig-1) and the gene sequence was deposited in Genbank under the accession number MF186882.

Differential scanning colorimeter (DSC)

Differential scanning calorimetry (DSC) is a technique in which the difference in energy inputs into a substance and a reference material is measured as a function of temperature whilst the substance and the reference material are subjected to controlled temperature program (15). The melting temperature\(T_m\) of control is 116.12°C and the melting temperature of inoculated LDPE sample after one month is 112.38°C. The melting temperature is decreased to 3.74°C in one month of incubation (Fig:2). DSC results clearly indicate that *Streptomyces werraensis* SDJM degrades LDPE as the melting temperature is reduced compared to control.

![Fig: 2 Differential scanning colorimetry](image)

**Fig: 2 Differential scanning colorimetry**

**Control**

**Sample**

The changes in the thermal properties of the treated (consortia) LDPE film were analyzed by Harshita et al(16) through determination of bulk structural characteristics with reference to untreated LDPE film as control. The \(T_m\) of untreated is 113.06°C and treated with consortium is 112.10°C whereas *Streptomyces werraensis* SDJM in present study the \(T_m\) is reduced to 3.74°C

**Gram per square meter (GSM)**

The LDPE strips kept for incubation is 10cmx10cm to study the activity. In present study biofilm formation by *Streptomyces werraensis* SDJM was observed in one week where as biofilm formation in case of *Pseudomonas* (17) was initiated from the 40th day of incubation. The LDPE samples from the inoculated MSM medium after one month is disinfected, air dried and weighed the sample and GSM is calculated as per
the below formula.

\[
\text{GSM} = \frac{\text{Wt. of the cut piece in gms}}{\text{Dimension in cm (Length x breadth)}} \times 10000
\]

The GSM of the inoculated sample is 43.5 whereas the GSM of control is 60.6. The GSM of the sample is reduced to 28.22% which indicates the degradation of LDPE by *Streptomyces werraensis* SDJM is more prominent in one month.

**Fourier transform infrared spectroscopy analysis (FTIR)**

FTIR is known as fingerprint region as each peak indicates its functional group. The *Streptomyces werraensis* SDJM treated samples were cleaned, air-dried and FTIR analysis was performed with a wavelength ranging from 400 to 4000 cm\(^{-1}\). There is decrease in the intensity as IR rays pass through the *Streptomyces werraensis* SDJM. Inoculated sample due to vibrational changes with C-H stretch, bending, rocking and there is shift in absorbance between 1000-1750 cm\(^{-1}\) (Fig: 3).

![Fig 3 Over lay of FTIR spectra of control and Streptomyces werraensis SDJM](image)

In the biodegradation of polyethylene, the initial abiotic step involves the oxidation of the polymer chain leading to the formation of carbonyl groups. These groups eventually form carboxylic groups, which subsequently undergo \(\beta\)-oxidation\(^{(13)}\) (Albertsson, 1987) and are completely degraded via the citric acid cycle resulting in the formation of \(\text{CO}_2\) and \(\text{H}_2\text{O}\). The strong absorption peaks at 719 and 1,472 cm\(^{-1}\) became weaker after microbial treatment. In addition, the intensity of those peaks reduced more in case of BSM-2 than BSM-1 whereas peaks at 2,919 and 2,850 cm\(^{-1}\) became sharper in the treated sample than the control one, here also the same microbial activity pattern was seen. The change in the peak values of almost all functional groups supporting the conformational change on polymer surface\(^{(18)}\). The intensity of the bands in the 1,000–1,700 cm\(^{-1}\) range (1,071, 1,541 and 1,649 cm\(^{-1}\)) is also attributed to the oxidized fractions because of the action of the selected microorganisms (*Lysinibacillus xylanilyticus* and *Aspergillus niger*). After 126 days of incubation as said by Atefeh Esmaeili et al\(^{(5)}\) whereas the change in the intensity of bands 1000–1,700 cm\(^{-1}\) range of LDPE by *Streptomyces werraensis* SDJM is only 30 days.

**X-ray diffraction analysis**

The XRD spectra of control and sample were analyzed after one month of incubation. XRD spectra of polyethylene show three peaks at 21.4, 23.5 and 26.8 of the angular position 2\(\Theta\). The intensity of the sample is reduced to half the intensity of control. This difference clearly indicates that *Streptomyces werraensis* SDJM plays a vital role in degrading LDPE (Fig: 4).

![Fig 4 XRD analysis of control and Streptomyces werraensis SDJM](image)

The XRD spectra of the non-UV- and UV-irradiated pure LDPE films before and after 126 days of incubation in soil in the presence and absence of the selected microorganisms. The intensity of the peaks was significantly decreased after 126 days of incubation in soil in the presence of *Lysinibacillus xylanilyticus* and *Aspergillus niger*\(^{(5)}\). The intensity of the peaks was significantly decreased after 60 days of incubation in the presence of the selected bacterium, *A.denitrificans* strain S1\(^{(19)}\). Compared to above study *Streptomyces werraensis* SDJM decreased the intensity of peaks in 30 days.

**CONCLUSION**

This concludes that the strain *Streptomyces werraensis* SDJM. Isolated from garbage is highly potent
in degrading LDPE compared to other microorganism in short period of time. Thus, non-degradable synthetic polymer, low density polyethylene can be degraded by Streptomyces werraensis SDJM and make our atmosphere eco-friendly to our future generations.

Ethical Clearance - Taken permission from Sripadmavathi Mahila University to conduct the research

Source of Funding- Self

Conflict of Interest – Biodegradation of environmental pollutants

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Effect of Proprioceptive and Flexibility Exercise Program along with Resisted Training on Anxiety and Depression with Diabetic Neuropathy

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ABSTRACT

Objective: diabetic neuropathy is a common complication of diabetes. Though the beneficial effect of exercise on diabetes is well established, specifically relationship between effect of exercises over the anxiety and depression in diabetic neuropathy has not been explored. Hence, the objective of this study was to examine the effect of exercises on anxiety and depression in people with Diabetic neuropathy.

Method: Sixty Four sedentary individuals (mean age 57 ± 5.11 years) with diabetic neuropathy were enrolled in a 8-week, supervised exercise program. Group A received proprioceptive exercise and group B underwent flexibility exercises along with a resisted exercise program for both the group. anxiety and depression were measured pre-intervention and post-intervention (4weeks & 8weeks) as outcomes of interest.

Results: Significant reductions in anxiety and depression in both groups.

Conclusion: The results from our current study suggest that proprioceptive exercises with flexibility exercises combined with resisted exercise both are equality effective in reducing the anxiety and depression among the diabetic neuropathy patients.

Keywords: Diabetic neuropathy, Proprioceptive exercises, Flexibility exercises, Resisted exercises, Hospital anxiety and depression scale.

INTRODUCTION

This study was undertaken as part of doctoral work on the effect of exercises in diabetic peripheral neuropathy (DPN) patients. Increasing evidences are emerging from screening studies done on diabetes in both developed and developing countries that the number of persons suffering from diabetes has been increasing at an alarming rate worldwide. From the etiological studies it is understood that this increase in epidemic is attributed to life style changes, poor glycaemic control due to changes in food habits, increasing level of mental stress among various other factors[1]. Diabetic neuropathy is a one of the serious complication of long term diabetes, which is associated with considerable morbidity, mortality and diminished quality of life and it affects around 50% of the people with diabetes[2]. Persons affected by Type II diabetes have mild to severe forms of nervous system damage, which also include impaired sensation, pain in the feet or hands and stress related syndrome. In an observational study among Indian population, DPN is reported to be the major complication of Diabetes and poor glycaemic control seems to be the major cause for the complications in diabetes[3]. In total, the risk factors which determines the severity of diabetic peripheral neuropathy are those of poor glycaemic control, Duration of diabetes, Damage to blood vessels, Mechanical injury to nerves, Autoimmune factors, Genetic susceptibility, Lifestyle factors such as Physical exercises, Smoking, Diet. In addition DPN increases the risk of adverse effects in Indian population due to poor foot hygiene, improper foot wear and frequent

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bare foot walking\textsuperscript{[4]}. Apart from pharmacological management for DPN, the limited number of studies support exercise as one of the important modality of treatment in controlling diabetes and its complications including the DPN\textsuperscript{[5-7]}. The coordination and integration of sympathetic nervous system is extremely important in the maintenance of blood glucose at rest and exercise. Strong evidences support that intensity and duration of exercises are very important in determining the fuel usage during exercises\textsuperscript{[8]}. In an analysis suggest that the effect of duloxetine and pregabalin for initial 8-week treatment in diabetic neuropathy was examined based on demographics and disease characteristics at baseline except for the presence of mood symptoms. Duloxetine treatment appeared to be particularly beneficial in diabetic neuropathy patient\textsuperscript{[9]}. The diabetic neuropathy patients diagnosed with gastroparesis had glycemic control improved ($p = 0.04$) and GI symptoms less ($p = 0.001$), after a follow-up time of 3.2 years (mean). Both groups reported severely impaired quality of life (QoL). In total 47% reported symptoms of anxiety, 38% symptoms of depression (scores $\geq 8$). The patients diagnosed with diabetic gastroparesis suffer from severely impaired QoL and a high burden of anxiety and depressive symptoms\textsuperscript{[10]}.

**METHOD**

**Subjects**

Sixty Four sedentary individuals (mean age 57 ± 5.11 years) with a confirmed diagnosis of painful DPN were enrolled in an 8-week, supervised exercise program. Group A received proprioceptive exercise and group B flexibility exercise and a resisted exercise program for both the groups. Anxiety and depression were measured pre-intervention and post-intervention (4 weeks & 8 weeks) as outcomes of interest.

**Measurements**

For Measurement of and anxiety and depression the Hospital anxiety and depression scale was used.

**Procedure**

Both the groups completed a 8-week of exercise training program. The physical exercise comprised of:

**Group A** - 1 minute warm up exercises

Proprioceptive Exercises (15 Minutes)

Rest (3 Minutes)

Resisted Exercises (15 Minutes), 1 minute cool down exercises, 35 minutes daily for 4 days/ week for 8 week.

**Group B** - 1 minute warm up exercises, Flexibility Exercises (15 min), Rest

(3 min) Resisted Exercises (15 min) 1 minute cool down exercises, 35 minutes daily for 4 days/ week for 8 weeks.

**Flexibility exercises**: General flexibility exercise involving all major muscle groups for 15 minutes duration. (Upper limb, Lower limb, Trunk) 2 to 4 repetitions. static stretching holding 15 seconds\textsuperscript{[11]}.

**Resisted exercises** involving major muscle group for 10 repetitions, 2 sets, mild intensity\textsuperscript{[12]}

**Proprioceptive exercises** (15 min) 3 repetitions with eye opening and closed, exercises are Without holding anything raising from the chair, Place some objects in the ground as obstacles and try to cross object by stepping, Head rotation, forward stepping, sideways stepping, tandem walking, single leg standing, stand on one leg with pillow\textsuperscript{[13]}.

The training program was performed at not beyond 70% of the individual age-predicted maximal heart rate (HRmax). The exercise sessions were supervised and exercise was monitored and registered.

**Statistical Analysis**

All statistical analyses were performed using the SPSSTM version 20.0. Prior to final analysis, data were screened for transcription errors, normality assumptions, homogeneity of variance, as prerequisites for parametric calculations of the analysis of difference and analysis of related measures. Alpha level was set at 0.05 to control for type I error and confidence interval was set at 95% for all statistical analysis. Descriptive statistics and repeated measures multivariate ANOVA was used for within and between-group comparisons at each follow-up period.

**RESULTS**

**Descriptive Statistics of the Main Study**

Table - I. Represents descriptive statistics of age, weight, heigh, duration of pain symptoms of 64 subjects in both the groups. Baseline comparison between the groups have been done using independent samples ‘t’ test.
Table: II. Baseline Comparisons in Both Groups

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>Group A [n=32] Mean ± SD</th>
<th>Group B [n=32] Mean ± SD</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS BASELINE</td>
<td>20.10 ±6.428</td>
<td>20.11 ±5.102</td>
<td>0.518</td>
<td>0.544</td>
</tr>
</tbody>
</table>

Table: III. Means and SD of Variables at end of 4th week and follow up period in both the groups.

<table>
<thead>
<tr>
<th>Follow Up At</th>
<th>Outcome Measure</th>
<th>Group A Mean ± SD</th>
<th>Group B Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 4</td>
<td>HADS</td>
<td>17.24± 6.330</td>
<td>17.17 ±6.658</td>
</tr>
<tr>
<td>Week 8</td>
<td>HADS</td>
<td>15.23± 6.28</td>
<td>14.20± 6.12</td>
</tr>
</tbody>
</table>

Repeated measure multivariate ANOVA for within-group comparison

**Table: IV. Within-Group Comparison Results with Interaction (N=32)**

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>F</th>
<th>P-value</th>
<th>Effect Size (Partial Eta Squared)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS</td>
<td>139.63</td>
<td>0.000</td>
<td>0.504</td>
</tr>
</tbody>
</table>

Table: V. Between-group comparison of various outcomes for group A&B

The Between Group Comparison of Result of Group A and Group B (N=32)

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>F</th>
<th>P-value</th>
<th>Effect Size (Partial Eta Squared)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS</td>
<td>0.135</td>
<td>0.701</td>
<td>0.001</td>
</tr>
</tbody>
</table>

HADS

The within-group repeated measure multivariate ANOVA with Greenhouse-Geisser correction (GGC) showed the significant statistical difference with F=139.63, p<0.000. A repeated measure multivariate ANOVA with (GGC) between-group analysis showed that the Group A and group B were not different statistically with F = 0.135, p<0.701.

**DISCUSSION**

Our main aim in this study was to find the levels
of anxiety and depression associated with diabetic peripheral neuropathy following combinations of exercises. With respect to anxiety and depression, both the groups showed significant reductions in anxiety and depression level in diabetic neuropathy patients. The better improvement in both group A and B. However it needs further understanding through objective quantification on the effect of proprioceptive exercises compared to flexibility exercises on whether a significant change can be produced. Further study is also needed to throw light on the effect of other outcome measure like quality of life. In a analysis of title which hypothesized that diabetes-related distress would vary by type of diabetes and medication regimen [Type 1 diabetes (T1DM), Type 2 diabetes with insulin use (T2DM-i) Type 2 diabetes without insulin use (T2DM)], the stress is higher for those with type 2 diabetes[14]. In a study the severity of diabetic peripheral neuropathy and depressive symptoms are assessed with the Hospital Anxiety and Depression Scale (HADS). The association between diabetic neuropathy symptoms and HADS was partially influenced by psychosocial variables such as perception , treatment lack of control, activities in daily life restriction and social self perception changes. Some findings showed the relationship between diabetic neuropathy and depressive symptoms and identified the factors to reduce the depressive symptoms in with diabetic peripheral neuropathy[15]. A study evaluated the effect of foot problems on mental health in diabetic patients. The diabetic patients (47 patients with and 49 patients without foot problems) and completed outcome surveys in which the greater depression symptoms (Hospital Anxiety and Depression Scale [HADS], the foot problems are significantly associated with mental health symptoms in diabetic patients. In our study, both the groups are matched in terms of baseline parameters of age, weight,height and duration of the condition. Baseline outcome measures also indicated matched pairs of subjects from both group A and B suggesting better inference from the statistical results. The examination of depressive symptoms increase the risk of diabetes and a diabetic foot ulcer, the symptoms of depression at baseline are associated with an increased risk of a diabetic foot ulcer[16]. The objective of this study was to examine the effect of exercises on anxiety and depression in people with Diabetic neuropathy.

In this study, from table III, it can be seen that, with the addition of flexibility or proprioceptive exercises to resistance exercises, there is a significant reductions in anxiety and depression levels in both the group of patients intermittently at 4 weeks and at 8 weeks.

**CONCLUSION**

The results from our current study suggest that proprioceptive exercises with flexibility exercises combined with resisted exercise both are equality effective in reducing the anxiety and depression among the diabetic neuropathy patients.

**Funding:** The authors carried out the work self financed.

**Conflict of Interest:** No conflict of interest as authors concerned.

**Ethical Considerations:** The study was initiated after getting the approval from the Institutional Human Ethics Committee of Saveetha University. The whole procedure of the study was very well explained to the participants by providing them with information sheet. Their doubts were cleared and the informed consent was obtained. Translation of the information sheet and the informed consent to the local language was done. Confidentiality of the data was ensured.

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Feasibility Study and Project Conceptualization of an upcoming Hospital in Navi Mumbai

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ABSTRACT

Today in India 80% of hospitals are owned by private sector whereas remaining 20% by Government sector. Doctors per 1000 population (0.7 per 1000) as well as Hospitals beds per 1000 population (0.9 per 1000) is less than that of WHO recommendation (3.3 per 1000)¹ The study sought to analyse whether the existing market of healthcare sector is feasible for setting up the proposed hospital in Ghansoli, Navi Mumbai & to assess its business potential. At present, there is a Bed deficit of around 450 in Navi Mumbai and 557 beds in Ghansoli.² The study aims to understand the existing healthcare facilities in the proposed area, to identify the lacunae and to analyze the need-gap for the proposed healthcare facility. Also, it suggests the best possible Healthcare Service Model.

A market survey and key competitor profiling were carried out. Using Simple Random Sampling method, 25 Hospitals/private clinics and 8 Diagnostic centres were selected and visited. Primary data was collected by conducting interviews with the consultant/administrators. Secondary data was obtained from journals, official reports, government websites and news articles. Data analysis was carried out to prescribe the facility mix for the proposed hospital.

The key findings of the survey indicated that majority population belongs to middle income group and is mostly un-insured. The study showed that, Ghansoli required super specialty services. Very few surgeries and ICU admissions have been observed. Also, it is observed that the CT and MRI services are not available in Ghansoli. Due to lack of basic healthcare facilities available in Ghansoli, majority of patients are compelled to seek healthcare services in other cities.

The most feasible plan is to establish 200 bed multispecialty tertiary care hospital with superior diagnostic and imaging facilities. Thrust areas should be Critical Care, Interventional Cardiology, Orthopedics, Neurology and Neurosurgery, Gastroenterology, Nephrology and Urology. As per industry requirement and benchmark, 20 % beds should be reserved for critical care. As per the Consultant survey and the bed mix observed in the hospitals during the survey, general wards and twin sharing should be 69% of the bed-mix, followed by remaining 11% of single occupancy. The proposed hospital should be a one-stop healthcare solution for the citizens at a competitive price.

This healthcare market study of Ghansoli area is a novel study, and would be useful in the development of healthcare infrastructure in this area.

Keywords: Feasible, Need-gap, Proposed hospital, Tertiary healthcare.

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INTRODUCTION

Rising competition in the healthcare industry and escalation of land cost has forced hospital operators to improve their infrastructure in order to stay viable
and competitive in the market. High cost of real estate
and non-availability of large spaces in metros, further
drive the need to have an efficiently planned hospital
as an answer to the ever increasing need for healthcare
services. The hospitals of tomorrow will face the same
dilemma and will have to cater to the demand of high
quality care at competitive cost, delivering excellent
customer service and dealing with high pricing at the
same time.

The need of the hour is to develop a planning tool
for hospitals that does not compromise on functionality,
patient safety & experience and maximizes the efficient
utilization of limited space. One is forced to think about
how they can develop a smarter design process that
addresses the initial capital constraint issue, delivers
more efficient hospitals, reduces long-term operation
costs and creates right sized convenient hospitals that
consumers demand.

At the same, one cannot ignore the overall operational
model of care, work-flow analysis, patient throughput,
staff efficiency, staff and patient safety concepts and
many other variables in the healthcare delivery equation.
There has been a relationship between medicine and
architecture since ancient times. Care of the ill has taken
place in a variety of settings which have been recognized
as a positive factor in the healing process

It is a challenge to the healthcare players to provide
maximum care within the space or less space available
by taking charge of the space, maximizing utilization
and marketing the efficiency. Space efficiency leads to
economization and is directly related to capital cost. As
the inpatient beds account for almost 70% to 80% of
the revenue beds in a tertiary care private hospital, it is
important to functionalize the size of inpatient rooms and
focus on patient and family needs. Scope for expansion
is an important factor for the growth and so is adaptation
to changing technology.

Government agencies involved in the granting of
permission to build hospitals in India, be it planning
agencies or accreditation agencies, are silent on the
aspect of space planning, operational & economic
efficiency

AIM

Feasibility Study and Project Conceptualization of
an upcoming hospital in Navi Mumbai

OBJECTIVES

To study the existing healthcare facilities in the
selected area.

To carry out detail analysis of proper siting,
market analysis, demographic analysis & likely
economic feasibility of return on investment and
competitor analysis,

Suggest recommendation for the new project about
requirement specialities and support services

METHODOLOGY

The study was conducted over a period of 1.5 months.
The market survey was carried out in the population of
Ghansoli, Airoli, Rabale, Koparkhairne, Nerul and Vashi
from which sample was drawn. Competitor Profiling
was done in 7 direct and indirect competitor hospitals.

Procedure Adopted:

Using Simple Random Sampling method, 25
Hospitals/private clinics and 8 Diagnostic centres were
selected and visited.

a) Primary data collection: To collect information,
direct personal meetings were conducted with
consultants/ hospital administrators. Structured
interview method was adopted to carry out the market
research using a questionnaire. Consultants of different
specialties& private practitioners as well as hospital
administrators were interviewed.

b) Secondary Data Collection: It was collected from
company records, office database, journals, government
websites and news articles.

Major Sources: Reports published by Directorate
of Census, Government of India, by Navi Mumbai
Municipal Corporation (NMMC) and by City and
Industrial Development Corporation (CIDCO).

Data analysis of both primary and secondary data
was used to generate perspectives on the healthcare
dynamics of Navi Mumbai region and the immediate
service area. These perspectives were used to forecast
healthcare demand and thus prescribe the facility mix for
the proposed hospital.

Limitation of the study is that it does not include the
financial feasibility.
FINDINGS

Fig 1: Site Map of the Hospital Project

As per Global norms, we notice a bed deficit of 450 in Navi Mumbai Region and 557 beds in Ghansoli.2

According to the Environment Status Report, NMMC 2014-15, the annual growth rate of population in Navi Mumbai is 5.3% whereas, Ghansoli’s Population has grown from 51,632 in 2001 to 88,749 in 2011 depicting an annual growth rate of 6.2%. So, the estimated population in 2016 is 1,16,276.3

The growth in the number of nursing homes from 2011-2015 has been at 26.56% while hospitals have grown by only 4.44%.4

Despite the fact that, there is a reliable supply of electricity, water and excellent connectivity of Navi Mumbai with surrounding regions as well as within the Nodes of Navi Mumbai (Divisions of Navi Mumbai as per CIDCO), the patients from primary catchment area have to travel for about 30 – 60 minutes to secondary regions to avail quality healthcare services.

The median household income across Airoli and Ghansoli lead to moderate spending power. However, due to the presence of large number of industries and companies being set up in these areas creating high employment opportunities, the proposed hospital can attract corporate customers seeking quality health care services.5

Market Survey Findings and Analysis of the data:

Fig 2 Market Survey Findings:

The 25 consultants / hospital administrators interviewed, gave the following responses 52% of the respondents were Hospital Administrators and 48% were Consultants6

Majority patients (i.e. 77%) visiting most of the hospitals and private practitioners were from primary catchment area such as Ghansoli, Talavli, Rabale, Mahape, Koperkhairane, Airoli, Digha, Vashi.

57% of the population availing healthcare facilities belong to the middle income group and 27% belong to the low income group while only 16% are High income earners.7

Fig 3: Economic Profile of Clientele

The preferred mode of payment for majority of the population (i.e. 79%) continues to be out-of-pocket expenditure and the remaining 21% make payments through TPAs and insurance schemes (both private & govt.)

High percentage of willingness to pay suggests that the people are ready to spend on good quality healthcare if they get value for money.8

Fig 4: Availability of other Medical Resources in the Neighbourhood

Affordable treatment is the most important factor (80%) that influences selection criterion for referring patients to higher setups, given the socio-economic status of the population. Proximity of location and availability of Medical Technology in hospital were perceived as equally important at 74% and 71%.

Fig 5: Analysis of Competitors

41% of the respondents opined that ‘all-under-one-roof’ setups i.e. tertiary care hospital with advanced
medical technology, infrastructure and experienced super specialty doctors will attract patients from within and outside Ghansoli.

47% of the stakeholders interviewed opined that starting a 100-200 beds hospital would be a feasible option.

57% of the consultants interviewed expressed their interest to get associated with a new setup which indicates that doctor engagement may not be a challenge for a new player.

The common reasons for availing healthcare services is a mix of communicable (gastroenteritis, dengue, malaria) and non-communicable diseases (Hypertension, diabetes, renal stones).

70% and above consultants surveyed opined that Ghansoli required super specialty services across all major medical and surgical specialties. Consultants from various specialities were interviewed to assess the work load referred out of Ghansoli. Majority of the cases referred were for specialized Spine and Neuro surgeries, Cardiac Surgeries, Oncology, Pediatrics, Urology, Nephrology and Gastroenterology.

Pathology and Radiology services are not up to the mark. It has been observed that the CT and MRI services are not available in Ghansoli. Patients have to travel to Vashi to avail these diagnostic services.

The daily IPD admissions were less than 5 in 53%, more than 10 in 29% and between 5-10 cases in 18% of the surveyed hospitals/private clinics.

The no. of surgeries performed and daily ICU admissions were found to be very less in the surveyed hospitals/private clinics which was indicative of the fact that, Ghansoli lacks quality critical care and super-specialty services due to which the patients are compelled to seek the said services outside Ghansoli.

7 Key competitors were surveyed for their service mix, bed mix, productivity and tariff to gauge the existing and popular healthcare facilities and accordingly position the proposed hospital in the ‘pricing-level of care’ matrix.

The direct competitors (Hospital 1,2,3,4) of the proposed setup are currently offering secondary level care with very few hospitals offering multi-specialty services. However the medical technology is not at par with the industry standards. The pricing of their services is in low-medium range.

The indirect competitors (Hospital 5,6,7) are offering multi-specialty services with some offering state-of-the art facilities. However, apart from Hospital 7, the pricing of services is high.

The positioning of the proposed hospital should be a tertiary care setup with multi-specialty services and quality diagnostic & imaging services made available under-one-roof. The proposed hospital should offer services at competitive prices.
**RECOMMENDATIONS**

In view of the growing population and dire need for tertiary healthcare facility in Ghansoli, a tertiary care hospital setup with a bed capacity of 200 beds is recommended.

Our proposed hospital being located just besides the highway, the incidence of road traffic accident cases would be high. Therefore, for efficient utilization of the golden hour by providing prompt medical treatment, it is imperative that the hospital has the provision for all the required diagnostic and imaging facilities.

The patient footfall may be increased by attracting patients mainly from primary catchment area by providing quality healthcare services under single roof.

**Thrust Areas:** Critical Care, Interventional Cardiology, Orthopaedics (Joint Replacement surgeries), Neurology and Neurosurgery, Medical and surgical Oncology, Gastroenterology, Nephrology and Urology.

General Medicine and surgery, Gynaecology, Paediatrics, Ophthalmology, ENT, Dental and Physiotherapy are the specialities which are essential in the primary catchment area and hence should be included.

**RECOMMENDED BED MIX**

20% of the hospital beds should be reserved for critical care. Thus, there must be 40 Critical care beds in total (ICCU, MICU, SICU and NICU).

Total In-patient beds should be 160. 36% of hospital beds must be for general ward (4 beds in 1 room) and 33% for twin sharing rooms (2 beds in 1 room) i.e. 72 and 66 beds respectively. 11% of hospital beds should be for single occupancy i.e. 22 beds.

Thus, the total revenue beds should be 200.9-10

50 service beds must be present for Ambulatory care, Pre-Operative and Post-operative beds, Cath lab and dialysis beds, Endoscopy beds and Emergency beds.

**Recommended Facility and Service Mix:**

30 OPD Consultation rooms are recommended.

2 Dental Chairs must be present in the facility.

There should be 6 Major Operation Theatres and 1 Minor Operation Theatre.

Central Sterile Supply Department, Blood Storage, Pharmacy and Medical Records Department must be present within the facility.

The proposed hospital must house complete Laboratory Services including Haematology, Microbiology, Biochemistry, Clinical Pathology, Histopathology and Serology.

The Diagnostic services must include Endoscopy, Laparoscopy, Ultrasonography, Mammography, Radiology and Imaging services like X-ray, OPG, CT scan, PET scan, MRI, Bone densitometer. There should be Non- invasive Cardiology services including ECG, TMT, and Echocardiography. EEG, EMG, PFT services must also be present.

Cath Lab and Dialysis services are recommended within the proposed hospital.

The proposed setup will house all the major services including Oncology. However keeping in mind the high capital expenditure, an out-sourced Radiation Oncology department is recommended.

**CONCLUSION**

The changing demographics, improvement in health awareness, rise in income due to industrial hub, a change in the lifestyle disease profile, rising penetration of health insurance will increase the demand for full fledged healthcare facilities.

The need for setting up integrated tertiary healthcare facilities in developing areas to cater to the growing commercial and residential core is increasing and the health care demand supply gap needs to be reduced.

The most feasible plan for proposed hospital is to establish 200 bed multispecialty tertiary care hospital, well equipped with required and latest medical technology.

The proposed location for the facility will experience good growth in terms of infrastructural and commercial development, upcoming employment and good connectivity in the days to come. This, coupled with strong clinical expertise and superior technology will help the hospital to flourish.

There is no **Conflict of Interest.**
The study is not funded by any agency.

The article is an outcome of PhD Research Process

There were no interventions on human/animals, hence no Ethical Committee clearance was required.

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The Application of Irene’s Donuts Innovative School Program Towards the Oral Health Care and the Hygiene Index of Children with Special Needs

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ABSTRACT

Background: Children with special needs should get a special care of the teeth and mouth health from both the teachers at school and the parents at home. Most students at the public elementary school for exceptional children in Semarang, Indonesia (77%) suffered from dental caries requiring a particular attention. Irene’s Donuts Oral Health School Innovative Program is a method that has been proven in reducing the risk of caries in the elementary school, so it needs to be tested then applicability to students in elementary school for exceptional children.

Method: The type of this research is a quasi-experimental study with a non-randomized pretest-posttest control group design. This study was conducted on 76 respondents with 38 respondents in the control group and 38 respondents in the experimental group.

Results: The pre and post-test result of dependent t-test against the Oral Hygiene Index (OHI-S) shows that the p-value is 0.000. The results of Mann-Whitney test on the behavior of dental and oral health care in the control group and the treatment group shows 0.024 of a p-value.

Conclusion: The conclusion from this research is that there is a difference between the OHI-S before and after the application of innovative Irene’s Donuts program to the students in elementary school for exceptional children. Moreover, there is a difference between the behavior of the maintenance of the oral health before and after the application of the program.

Keywords - Exceptional children, Oral Health School Program, Irene’s Donuts, OHI-S

INTRODUCTION

Oral health is necessary to improve public health because the mouth is a significant gateway entry of food into the human body. The effort is focused on promoted, and preventive activities are corresponding to the new paradigm of health policy reform. The main problem of oral health is the prevalence of dental caries (cavities pathogen) so high that almost every patient who came to the dental clinic units have a toothache complaint.

Childhood is a time of growth and development where the oral health should be optimal for dental health including for children with special needs whose masticatory function is not optimal and will affect the physical health in general (1).

Children with special needs are children who have abnormalities in the context of proper education in the maintenance of dental and mouth health should receive particular attention from teachers in school and parents at home. Most children with special needs in the public elementary school for exceptional children Semarang indicate that (77%) suffered from dental caries, so it needs particular attention (2). This phenomenon suggests that oral health school program in public elementary
school for exceptional children has not run optimally. Innovative Irene’s Donuts is a program developed in Indonesia with innovative methods where parents are involved in it. This program has been proven to reduce the risk of caries in the primary and secondary school but not tested on the students in elementary school for exceptional children. The purpose of this study was to describe Oral Hygiene Index (OHI-S) and the behavior of dental and oral health maintenance children with special needs in the elementary school for exceptional children Semarang before and after application of innovative programs Irene’s Donuts. Besides, it also aims at analyzing the differences OHI-S as well as differences in the behavior of the maintenance of oral health in children with special needs elementary school for exceptional children before and after application of innovative programs Irene’s Donuts.

The benefits of this research are that it can improve oral hygiene condition children with special needs students and encourage behavior change maintenance of oral health in the right direction. It could also help the implementation of a program of activities which have not yet done so that the desired objectives can be achieved.

**METHODOLOGY**

The research is a quasi-experimental with a pretest-posttest control group. The population in this study is the children with special needs in elementary school for exceptional children of Semarang as many as 280 children. The sample is children with a special needs mentally disabled category as many as 72 children divided into two groups randomly: experimental and control groups. Data were analyzed by univariate analysis for the behavior. The frequency distribution was used to describe oral health maintenance and OHI-S before and after the application of the program. A dependent t-test was used to determine the differences in the behavior of oral health maintenance and OHI-S in the experimental group and the control group before and after the application of the program.

**RESULTS**

The results of the frequency distribution of OHI before treatment in control group indicated 11 respondents (28.9%) were in lousy category whereas none of the respondents (0%) was found of this class in the treatment group. Those categorized as medium categories were 27 respondents (71.1%) in the control group while in the treatment group, 37 respondents (97.4%) were found in this type. None of the respondents (0%) fell into a proper category in the control group while in the treatment group was found one respondent (2.6%).

After treatment, the results of the frequency distribution of OHI in control group indicated four respondents (10.5%) were in lousy category whereas none of the respondents (0%) remained in the treatment group. Those categorized as medium categories increased into 34 respondents (89.5%) in the control group while in the treatment group, 27 respondents (71.1%) were found in this type. None of the respondents (0%) fell into a right category in the control group while in the treatment group increased into 11 respondent (28.9%).

Before treatment, the result of the behavior of the frequency distribution of dental and oral health care in the control group was perceived as less in 11 respondents (28.9%). The medium category was one respondent (2.6%), and the excellent type was 26 respondents (68.4%). After treatment, the result of the behavior of the frequency distribution of dental and oral health care in the control group was perceived as less decreased into nine respondents (23.7%). The medium category increased to 4 respondent (10.5%) and the excellent division slightly reduced to 25 respondents (65.8%)

Before treatment, the result of the behavior of the frequency distribution of dental and oral health care in the treatment group was perceived as less in 10 respondents (26.3%). The medium category was five respondent (13.2%), and the excellent type was 23 respondents (60.5%). After treatment, the result of the behavior of the frequency distribution of dental and oral health care in the control group was perceived as less decreased into two respondents (5.3%). The medium category declined to 3 respondent (7.9%), and the excellent class increased significantly into 33 respondents (86.8%).

The test results dependent t-test against Oral Hygiene Index (OHI) pre and post-test showed p-value equal to 0.000. Meanwhile, the results of test Mann-Whitney on the behavior of dental and oral health care in the control group and the treatment group showed the p-value of 0.024.
DISCUSSION

Oral Hygiene Index (OHI) of children with special needs studying in the elementary school for exceptional children in Semarang before and after application of Irene’s Donuts innovative program showed that the p-value < 0.05. This figure shows the difference between the difference Oral Hygiene Index in the pre-post control group and the treatment group. This difference is influenced by various behavioral factors of oral hygiene, such as brushing teeth after meals and before bed at night, as well as the role of parents is so significant in providing information about the timing and how to clean teeth properly. The level of oral hygiene is closely related to a person’s consciousness in oral health, one of which is about how to brush teeth correctly and adequately (4).

The results of different test behavior of dental and oral health maintenance between control and treatment groups showed no difference because the p-value = 0.024 is < 0.05. This indication shows that innovative Irene’s Donuts needs more instrumental in changing the behavior of the maintenance of oral health in the right direction for children with special needs compared with the usual extension without involving the parents. This because they require special treatment either from parents or teachers. This is by the opinion which says that children with special needs are a child who had a significant abnormality/deviation (physical, mental, intellectual, social, emotional in the process of growth and development compared to the other children of their age, so they require special education services (5).

Frequency distribution results showed that in the control group decreased the percentage of respondents in the category of good dental health maintenance behavior and mouth that is 68.4% to 65.8%. Meanwhile, in the treatment group increased the percentage of respondents in this category from 60.5% to 86.8%. This is caused by children with special needs usually have a lack of understanding or misperception in children with special needs in control group who were given regular counseling without involving the parents. One should pay attention that in children with special needs during treatment group, parents must be involved considering the children with special needs stay more at home much longer than in schools. This is by the opinion saying that the nearest home environment: parents, siblings, and caregivers are major shapers of children behavior (6).

The role over the application of innovative Irene’s Donuts is the availability of suitable and right technique in the maintenance of oral health in the treatment group played by teachers and parents of children with special needs, such as brushing teeth regularly at least 2 times a day in the morning before breakfast and at night before bed. Information provided by teachers and parents also increases the understanding of teachers and parents of children with special needs in the maintenance of oral health, so the guidance and monitoring of the behavior of dental and oral health can be carried out both at school and home. The act of dental and oral health maintenance is indeed expected to reduce the risk of caries as this is consistent with the finding (7) that proves the school program innovative of Irene’s Donuts applied in an elementary school can reduce dental caries.

CONCLUSION

Oral Hygiene Index for children with special needs in the elementary school for exceptional children of Semarang before the application program innovative school program called Irene’s Donuts is still a lot in the category of the medium. However, after the application of the program, the group is improved into good. Similarly, before the implementation of Irene’s Donuts program, less attention is given to oral health care but after application of the program, the focus is improved.

Conflict of Interest: The author has no conflict of interests related to the conduct and reporting of this research.

Source of Funding: Source of the fund for this project was by Health Polytechnic Ministry of Health, Semarang, Indonesia.

Ethical Clearance: Before conduct of the study written permission was obtained from Health Polytechnic Ministry of Health, Semarang, Indonesia. Consent and willingness were established from all the subjects who meet inclusion criteria of this study.

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Self Perceived Hand Hygiene among Student Health Professionals in a Tertiary Care Teaching Hospital in Southern India

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ABSTRACT

Implementation of and adherence to practice of hand hygiene in a health care organization not only prevents health care-associated infections (HAI) but also limits the transmission of micro-organisms. With “Clean Care is Safer Care” as a main agenda of the global initiative taken by WHO on patient safety programs, it is time for developing countries to develop the much-needed policies for implementation of practices, which will prevent the basic infection in health care setups. The subjects involved in this study were assessed for knowledge and practice of hand hygiene. Interestingly, this study revealed that awareness & proper practice of hand hygiene was not satisfactory as the mean range of number of correct answers was 15-17 out of 28 questions. This was despite 83.3% of the sample having said that they got formal training in hand hygiene. The comparison of knowledge of the two groups showed that the nursing students were more knowledgeable than the MBBS students. There was a significant difference in the level of knowledge among Nursing and MBBS students as found in similar studies where the knowledge of Nursing students was better than that of MBBS students. Van de Mortel et al. in 2010 studied the hand hygiene knowledge, beliefs, and practices among nursing and medical students. They found that the knowledge of Nursing students was more than that of Medical students (P < 0.01), which is consistent with our study.

Keywords: Hand hygiene, MBBS, Nursing

INTRODUCTION

Hand hygiene is a general term referring to any action of hand cleaning by using water and detergent and/or the use of alcohol-based hand sanitizers for the removal of transient micro-organisms from hands¹. Hand-washing with soap and water has been considered a measure of personal hygiene for centuries and has generally been embedded in religious and cultural habits. Nevertheless, the relationship between hand-washing and the spread of disease was established only two centuries ago. The World Health Organization (WHO) has issued guidelines for hand washing procedures in order to decrease the prevalence of hospital associated infections but lack of knowledge amongst healthcare workers is associated with poor compliance².

Implementation of and adherence to practice of hand hygiene in a health care organization not only prevents health care-associated infections (HAI) but also limits the transmission of micro-organisms. It is an important practice for all healthcare providers and is recommended in all national and international guidelines for infection control in an organization. It is a basic expectation from a patient and their families. Hand hygiene is one among the five key initiatives addressed by the world alliance for global safety challenges.

The total number of hand exposes in a hospital may vary from several tens to thousands per day. Thus with each hand to surface exposure the transient flora of hand and the micro-organisms present on the object are exchanged. WHO reports an overall estimate of about 1.4 million patients in developed and developing
countries affected by health care-associated infections. In India, hand hygiene is practiced as a custom and is taught at school and community levels to reduce the burden of diseases, but there is minimal information available about the promotion of hand hygiene in health care facilities. Due to poor hand hygiene among health care workers, their hands serve as the most common vehicles for the transmission of healthcare associated infections. Despite the procedure being very simple, compliance with hand hygiene practices among healthcare workers can be as low as 40%. Hand hygiene is regarded as one of the key elements of infection control activities. With the increasing burden of health care associated infections (HCAIs), the increasing severity of illness and the complexity of treatment, exacerbated by Multi-Drug Resistant (MDR) pathogen infections, health care practitioners (HCPs) are stepping back to simple measures like hand hygiene. This is because enough scientific evidence supports the observation that if properly implemented, hand hygiene alone can significantly reduce the risk of cross-transmission of infection in healthcare facilities (HCFs).

In this study an assessment was done on the knowledge and practice of hand hygiene among MBBS & Nursing students as they form the largest population among health care workers and are the nucleus of the health care system.

RESEARCH DESIGN

Aim of the study.

To study the Knowledge and Practice of Hand Hygiene among MBBS and Nursing Students.

OBJECTIVES

To study the knowledge of hand hygiene among final year MBBS and final year B.Sc. Nursing students.

To study the practice of hand hygiene among final year MBBS and final year B.Sc. Nursing students.

To compare the knowledge of final year MBBS and final year B.Sc. Nursing students.

SCOPE OF THE STUDY

With “Clean Care is Safer Care” as a main agenda of the global initiative taken by WHO on patient safety programs, it is time for developing countries to develop the much-needed policies for implementation of practices, which will prevent the basic infection in health care setups.

METHODS AND METHODOLOGY

Study design

Descriptive cross sectional study

Study tool

Structured Questionnaire

Study setting

A tertiary care teaching hospital in Southern India.

Study Population:

Final year MBBS and Final year B.Sc. Nursing students.

Sample Size:

Total: 175

MBBS (120) & Nursing (55)

Sampling Method:

Stratified Random sampling

Study Duration:

6 Months, (Dec 2015- April 2016)

Ethical Clearance: Protocol approval was taken from the Institutional Ethics Committee of the tertiary care teaching hospital. Medical and Nursing students were briefed on the content and nature of the study. A self-administered questionnaire containing a set of questions regarding hand-hygiene knowledge and practices was distributed to all participants. Knowledge was assessed using the WHO hand hygiene questionnaire for health care workers.

DATA ANALYSIS

Knowledge

The instrument used was the questionnaire on hand hygiene knowledge in health care workers originally developed by the WHO (2009). The questionnaire had 28 items with both multiple choices and “Yes” or “No” questions in English. It took about 10 minutes to complete the questionnaire. The respondents were requested to
complete the questionnaire without any discussion with anybody else. The questions encompassed queries on washing hands/hand-rub, procedure for hand hygiene etc. Knowledge of both samples was analyzed based on the frequency & percentage and the mean & standard deviation of correct responses. To compare the knowledge of both samples, a statistical tool: Independent 2 sample t-test was used with $p=0.05$ (95% confidence interval), assuming the variance of both samples are equal and there is no significant difference in level of knowledge in both the groups.

**Practice**

For the assessment of practice, another questionnaire based on the knowledge questionnaire was designed. A total of 10 questions were asked. The purpose of the practice questionnaire was to assess the hand hygiene procedure compliance among the study population. It was assessed based on the highest frequency & percentage of options given.

**RESULTS**

There were a total of 175 study participants (55 nursing students and 120 medical students). Among these, a majority (83.3%, 140/175) had claimed to have received formal training in hand washing.

**Knowledge**

The knowledge score for hand hygiene among the Nursing students was 16.55± 3.023 (mean±SD). In MBBS students it was 15.39±3.331 (mean±SD) out of a possible maximum of 28. 73% of nursing students and 59% of MBBS students answered correctly that unclean hands of healthcare workers was the main route of transmission of potentially harmful germs between patients. 62% of nurses and 31% of MBBS students answered correctly that germs already present on or within the patient were the most common source of germs responsible for healthcare associated infections. 51% of nursing students and 43% of MBBS students correctly said that the minimal time needed for alcohol-based handrub to kill most of the germs present on the hands is 20 seconds. 24% of nursing students and 34% of MBBS students answered correctly that the minimum time needed for hand-wash to remove maximum germs on hands was 45 seconds. 78% of nursing students and 85% of MBBS students answered correctly that rubbing was the right hand hygiene method to be used before palpation of the abdomen. 31% of Nursing students and 22% of MBBS students answered correctly that rubbing was the right hand hygiene method to be used before giving an injection. 24% of Nursing students and 18% of MBBS students answered correctly that washing was the right hand hygiene method to be used before emptying a bed pan. 35% of nursing students and 48% of MBBS students answered correctly that rubbing/washing was the right hand hygiene method to be used after taking off the examination gloves. 36% of nursing students and 55% of MBBS students answered correctly that rubbing was the right hand hygiene method to be used after making a patient’s bed. 98% of nursing students and 82% of MBBS students answered correctly that washing was the right hand hygiene method to be used after visible exposure to blood.

84% of nurses and 75% of MBBS students answered correctly that wearing jewellery is associated with an increased likelihood of colonization of hands with harmful germs. 91% of nurses and 90% of MBBS students answered correctly that damaged skin is associated with an increased likelihood of colonization of hands with harmful germs. 95% of nurses and 86% of MBBS students answered correctly that artificial fingernails are associated with an increased likelihood of colonization of hands with harmful germs. 56% of nurses and 49% of MBBS students answered correctly that regular use of a hand cream was not associated with an increased likelihood of colonization of hands with harmful germs.

If we compare the knowledge between MBBS & Nursing students, there is a significant difference ($p=0.03$), assuming the variance is equal i.e. the knowledge of nursing students is more than MBBS students (Independent sample t test).

**Practice**

93.1% (163/175) of the study sample used alcohol based hand rub for hand hygiene routinely. 38% (21/55) nursing students & 48% (58/120) MBBS students said 30 seconds is the actual amount of time spent by them on each hand wash. A majority in both the groups - 44% (24/55) & 41% (49/120) of Nursing and MBBS students respectively said 20 seconds is the actual amount of time spent on a hand rub (Table-2). A majority of Nursing & MBBS (80% & 68% respectively) students
said that they were aware of the WHO guidelines for hand washing, but only 9% & 18% respectively gave the correct answer when asked for the numbers of steps. 98% (43/44) of nursing students and 96% (78/81) of MBBS students said that they practice all the steps of hand washing, but 91% (50/55) of Nursing and 79% (99/120) of MBBS students did not know the correct number of steps.

**Figure 1- Knowledge**

**DISCUSSION**

The subjects involved in this study were assessed for knowledge and practice of hand hygiene. Interestingly, this study revealed that awareness & proper practice of hand hygiene was not satisfactory as the mean range of number of correct answers was 15-17 out of 28 questions. This was despite 83.3% of the sample having said that they got formal training in hand hygiene. The comparison of knowledge of the two groups showed that the nursing students were more knowledgeable than the MBBS students.

There was a significant difference in the level of knowledge among Nursing and MBBS students as found in similar studies where the knowledge of Nursing students was better than that of MBBS students. Van de Mortel et al. in 2010 studied the hand hygiene knowledge, beliefs, and practices among nursing and medical students. They found that the knowledge of Nursing students was more than that of Medical students (P < 0.01), which is consistent with our study.

**CONCLUSIONS AND RECOMMENDATIONS**

Hand hygiene procedures are the most efficient and cost effective techniques in preventing the spread of infection in healthcare settings, thus reducing the incidence of healthcare associated infections. Our study shows the significance of training programs on hand hygiene practices and the amount of time to be spent for effective hand washing. Continuous monitoring of performance and feedback is of utmost important to encourage them to follow the appropriate hand hygiene practices. The low levels of awareness show that there is a need for a planned schedule of training programs to train & re-train all health care professionals. It is of paramount importance to sensitize all health care professionals to the significance of hand hygiene.

**Conflict of Interest**: Nil

**Funding**: Nil

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15. Assessment of the Knowledge, Attitude and Practices Regarding

16. Hand Hygiene amongst the Healthcare Workers in a Tertiary Health Care Centre

17. Assessment of the Knowledge, Attitude and Practices Regarding

Efficacy of Interferential Therapy Versus Transcutaneous Electrical Nerve Stimulation to Reduce Pain in Patients with Diabetic Neuropathy

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ABSTRACT

Background: Diabetic neuropathy (DN) is possible and is the commonest among all long-term complications of diabetes mellitus (DM). Manifestations may be somatic or autonomic. Parasthesias involving the lower limbs are usually the earliest manifestations. In course of time numbness is found from loss or diminished sense of touch, pain, temperature, vibration and position sense in long – standing cases.

Transcutaneous electrical nerve stimulation (TENS) is a safe noninvasive treatment. This helps in blocking of pain gate mechanism.

Interferential therapy (IFT) is the application of two medium-frequency currents in order to produce an amplitude-modulated low frequency effect in the tissues.

Objective: Is to evaluate the effect of IFT vs TENS to reduce pain in patients with diabetic neuropathy.

Method & Methodology: 30 patients were arbitrarily selected and alienated into two groups (Group A and Group B) correspondingly. Group A was treated with TENS for 15mins/5times/week. Group B was treated with IFT for 15mins/5 times/week with an intensity obtained to an appropriate level with the control of the patient’s feeling and with free exercises for both groups for a period of 4 weeks. The pre & post treatment values were extracted.

Results: Table 1 represents the pre and post values of Group A and B. Table.2 shows the comparison between both the groups A & B. Group B showed statistically more reduction in the intensity of pain when compared with Group A.

Conclusion: IFT is more effective in reducing pain in patients suffering with Neuropathic pain when compared with TENS.

Keywords: Diabetic Neuropathy (DN), Diabetes Mellitus (DM), Interferential therapy (IFT), Transcutaneous electrical stimulation (TENS).

INTRODUCTION

Diabetic neuropathy (DN) is possible and is the commonest among all long-term complications of diabetes mellitus. The incidence varies widely depending on age, nutritional status, duration, quality of glycemic control and criteria (subjective, objective & electrophysiological) for diagnosis. When we look for diabetic neuropathy, over 30% of patients who are attending diabetic clinics are evident¹.

Neuropathic manifestations may be somatic or autonomic. Parasthesias involving the lower limbs (legs and feet) are usually the earliest and the commonest
subjective manifestations of diabetic neuropathy. In course of time numbness is found from loss of sensation follows. Sense of touch, pain, temperature, vibration and of position sense are diminished or lost in long – standing cases.

In addition to discomfort, all areas of patients’ lives including sleep, mood, mobility, ability to work, interpersonal relationships, overall self-worth, and independence, are affected1.

At times episodes of neuropathic pain (dysthesias, allodynia) may be severe so as to disturb sleep and disrupt work. These may last for variable periods. Clinical and electrophysiological evidence of diabetic peripheral neuropathy (DPN) is estimated to be about 70% in both type 1 & 2 diabetes mellitus1.

In order of treating neuropathy, initially the blood glucose levels were brought to normal in order to avoid further damage to the nerves by using diabetic medications and monitoring the blood glucose levels. Along with this patients were advised to take opioids, NSAIDS, tricyclic anti-depressants. But due to its side effects experts recommend to avoid the medication2.

So Non- Pharmacological treatments like a cupuncture, acupressure3, infrared rays4, pulsed magnetic fields5 6, percutaneous electrical nerve stimulation7, spinal cordelectrostimulation8, Transcutaneous electrical nerve stimulation9 and Interferential therapies10 were proposed

Transcutaneous electric nerve stimulation (TENS) can be used to describe a range of electrical currents including neuromuscular stimulation. TENS is a safe noninvasive treatment. It can be used for treating neuropathic pain and other types of pain. This helps in blockage of pain gate mechanism11 13.

Gate control theory describes that if nonnociceptive fibers are stimulated they will inhibit the firing of nociceptive fibers at the laminae12. By applying TENS it will stimulate the firing of Aβ fibers which are nonnociceptive. They inhibits the activation of interneurons, thereby the firing rate of the nociceptive neurons will reduce13.

Interferential therapy involves in the application of two medium-frequency currents to the skin in order to produce an amplitude-modulated low frequency effect in the tissues. It can be used to treat deeper tissues with pain11 13.

When IFT is applied the activity in the large fibers takes preference over the small fibers when stimulated at 100Hz the pain gate will be closed. So that the pain information which is entering the central nervous system conscious level gets block, thereby pain will decline14 15.

MATERIALS & METHODOLOGY

Subjects: Thirty patients, both males and females suffering with Neuropathic pain from atleast five years, were selected for the study from Vaagdevi Physiotherapy and Paediatric rehabilitation centre and MGM hospital with age between 45 – 60 years.

Type of study: Simple randomized experimental study.

Duration of study : 4 weeks

Inclusion Criteria : Patients diagnosed with Diabetic Neuropathy Patients presenting with Neuropathic pain

Patients with DN and who don’t have any additional Neurological, Cardiac & Orthopedic complications

Exclusion criteria: Patients suffering with neurological problems, renal disorders, vascular problems, long standing diseases, Orthopaedic and cardiac problems.

Outcome measures :

Mc. Gill Pain Questionnaire: This scale consists of 20 groups. Patients have to select 3 words from group 1-10 which best describes their pain, 2 words from 11-15, one word from group 16 and one word from 17-20 groups. After finishing the questionnaire patients have to select 7 words that best describe their pain. Patient can use various words more than once.

METHODOLOGY

30 patients were arbitrarily selected and alienated into two groups (Group A and Group B) correspondingly. Group A was treated with TENS with a frequency of 100Hz16 for 15mins/5times/week. The intensity was in tune till Strong, rhythmic contractions were produced along with free exercises for lower limbs. Repetitive biphasic pulsed currents with an amplitude ranging
from 0 to 60 mA, pulse durations between 50 and 400 microseconds & pulse frequencies between 1 and 200 pulses per second were applied\textsuperscript{17,18}.

Group B was treated with IFT for 15mins/5 times/week by creating an interference between the electrodes (by positioning electrodes properly) with an intensity obtained to appropriate level with the control of the patient’s feeling and with free exercises. The parameters used for IFT were carrier frequency-4000 Hz, Base frequency -100 Hz, Sweep frequency -0 Hz were used\textsuperscript{19}.

Both the groups were comfortably positioned during treatment. Their pre and post treatment values were extracted to find the effect of TENS and IFT with free exercises after every week for four weeks and assessed for results by using Mc. Gill Pain Questionnaire.

RESULTS

Both the groups pre and post treatment values were extracted. Group A received TENS for four weeks, whereas Group B received IFT for four weeks. The pre and post treatment values were calculated by using \textit{Kruskal-Wallis} test.

The test statistic is given by

\[ H = \frac{12}{n(n+1)} \sum_{j=1}^{c} \frac{T_j^2}{n_j} - 3(n+1) \]

The calculated value for Group A (Pre & Post treatment values) is \( H = 49.54 \), here \( n = 15 \ (>10) \) so the \textit{kruskal-wallis test} is converted into chi-square test.

Whereas the calculated value for Group B (Pre & Post treatment values) is \( H = 53.22 \), with their mean and standard deviation.

\textbf{RESULTS}

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The calculated value for Group A (Pre & Post treatment values) is \( H = 49.54 \), here \( n = 15 \ (>10) \) so the \textit{kruskal-wallis test} is converted into chi-square test.

Whereas the calculated value for Group B (Pre & Post treatment values) is \( H = 53.22 \), with their mean and standard deviation.

\textbf{T A B L E 1: Mean and Standard Deviation of Group A and B (Pre & Post Values)}

<table>
<thead>
<tr>
<th>GROUP – A</th>
<th>GROUP – B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre – Values</td>
<td>Post – Values</td>
</tr>
<tr>
<td>MEAN</td>
<td>14.13</td>
</tr>
<tr>
<td>S. D</td>
<td>1.09</td>
</tr>
</tbody>
</table>

\textbf{table value:} \( \chi^2(4) \) d.f. = 9.488.

In both instances the calculated \( H \) value is greater than table value. So we reject the null hypothesis.

Later on, both the groups were compared significantly by using \textit{wilcoxon – rank sum} test. The calculated \( Z = 2.178 \), (as \( n = 15 \), so we used \( Z \)-test statistic)

\textbf{T A B L E 2: Comparision of Group A & B (MEAN & STANDARD DEVIATION)}

<table>
<thead>
<tr>
<th></th>
<th>GROUP – A</th>
<th>GROUP – B</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>8.933</td>
<td>7.6</td>
</tr>
<tr>
<td>STANDARD DEVIATION</td>
<td>0.4193</td>
<td>0.3491</td>
</tr>
</tbody>
</table>

\textbf{table value:} 5% LOS \( Z_{tab} = 1.96 \)

When compared with the tabulated \( Z- \) value, the null hypothesis is rejected.

DISCUSSION

This study was performed to identify the effect of TENS Vs IFT in reducing Neuropathy pain in lower limbs. Patients were assessed for the intensity of pain by using Mc Gill Pain Questionnaire. The pre treatment values were extracted for both the groups and post treatment values were extracted every week for four weeks. After four weeks the pre and post treatment values were calculated in both the groups by using \textit{Kruskal-Wallis} test.

There was a significant difference in the pain intensity of Group A which received TENS for four weeks (Mean: 8.933). Group B also showed significant difference in reduction of pain after receiving IFT for four weeks (Mean: 7.6).

Both the groups showed significant difference in reduction of pain when assessed with Mc Gill Pain Questionnaire.

Later both the groups were compared by using \textit{Wilcoxon-Rank Sum} test.

Therefore the results of Group B (mean: 7.6) showed significant reduction in the intensity of pain when compared with the results of Group A (mean: 8.933).
CONCLUSION

Both the groups showed the results in sinking pain in Diabetic neuropathy patients. Whereas Group B (IFT group) showed marked decline in the intensity of pain when compare with Group A. Therefore IFT is extra effective in dropping the intensity of pain in the patients of Diabetic Neuropathy.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: IHEC/VCOP/VCOPH/2017/3/5

REFERENCES

Translation and Validation of Mc Monnies (V2) Questionnaire English Version to Local Vernacular Language Kannada Version- A Pilot Study

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ABSTRACT

Purpose: To translate and validate the McMonnies questionnaire from English to Kannada. Methodology: Two subject teachers in Kannada and one Optometry student, native Kannada speakers translated the McMonnies questionnaire from English to Kannada. A single version was evolved from these three versions. A subject expert well versed in both languages back translated this version from Kannada to English. The study was conducted in accordance with the Declaration of Helsinki. Informed written consent was obtained from all patients prior to their enrolment in this study. The translated version was then used on 30 patients to check for reliability and repeatability. Results: This study showed good internal consistency of 0.720 using Cronbach’s alpha analysis. The test-retest reliability indicated by Intra class correlation reported a value of 0.628. Conclusion: The results report that the translated and validated McMonnies questionnaire have good internal consistency and test-retest reliability. This can be administered among Kannada speaking population to diagnose dry eyes and plan further with management.

Keywords: Dry eye, McMonnies questionnaire, Dry Eye Disease (DED), test-retest reliability

INTRODUCTION

Dry eye is defined as a “multifactorial disease of the tears and ocular surface that results in the symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is featured by increased osmolarity of the tear film and inflammation of the ocular surface”¹. Based on self-report of dry eyes in the Beaver Dam Offspring cohort, prevalence of dry eye was reported as 14.5% (17.9% in women and 10.5% in men)². The prevalence of Dry Eye Disease (DED) in India is 32%, 9.9% having mild DED; 61.2% having moderate DED; and 28.9% having severe DED.³ Since dry eye is symptom based condition, there are a number of symptom based questionnaires available to check for the severity of the condition. McMonnies, Ocular surface disease index and Standard Patient Evaluation of Eye Dryness (SPEED) questionnaire are few among the lot often utilized in clinical decision making. Since India is a diversified nation with plenty vernacular languages and English as the second language, it’s observed in routine practises that majority of population experience difficulty in comprehending complex medical terms in English and would rather prefer simplified medical terms in the vernacular language. Kannada is the state language well-spoken all across Karnataka among various sectors and classes of people. The need of local vernacular language (Kannada) based questionnaire is mandated as both rural and urban population is susceptible to dry eye due to the tropical weather setup in the state. This study makes an attempt in translating the Mc Monnies English dry eye questionnaire to Kannada and validates the Kannada set among a cohort of people to check for reliability and repeatability.
Materials & methods: The study design was a prospective, cross sectional design from a period of August 2016 to February 2017. Study setting was the Optometry clinic, School of Allied Health Sciences, Manipal. As a pilot work, the sample size taken was 30. Subjects knowing to read and speak Kannada were included. Materials used was English validated McMonnies (V2) questionnaire. The study was conducted in accordance with the Declaration of Helsinki. Informed written consent was obtained from all patients prior to their enrolment in this study.

Procedure:

1. The first step was to translate the McMonnies questionnaire from English to Kannada. Two teachers, native Kannada speakers and one Optometry student (fluent in Kannada) unaware of the McMonnies questionnaire translated the questionnaire from English to Kannada independently.

2. Then a panel consisting of three Optometry faculties and a clinician from Respiratory therapy, all well versed in English and Kannada, arrived at one version of the Kannada questionnaire from the three versions submitted by the teachers and the Optometry student.

3. One English speaker (Professor in Communication), also well versed in Kannada being unaware of the McMonnies English questionnaire, back translated the draft from Kannada to English. This new back-translated English version was then given to the panel.

4. The panel then compared the back-translated English questionnaire with the original McMonnies questionnaire to check for the reliability of the questionnaire.

5. The application of the Kannada version of the questionnaire was done in a pilot study (n=30). The questionnaire was administered to the 30 subjects and asked for the comprehension of questions. The subjects were asked to report errors and suggest change in words to make them understand the questionnaire better. None out of 30 neither reported errors nor changes for the translated questionnaire.

6. After a period of 2 weeks, the translated questionnaire was administered to the same set of 30 subjects to check for its repeatability.

The data was analysed using Statistical Package for the Social Science (SPSS) Version 20. Cronbach’s Alpha was used to check for internal consistency. Intra Class Correlation was used to check for the test-retest reliability.

RESULTS

The 30 candidates in the pilot study were between the ages of 18 to 60 years. Out of 30 candidates 15 were males and 15 were females. Content Validity: A panel of five evaluated the questions from three translated versions. Only questions accepted by at least three out of the five experts were included in the questionnaire. Back and forth translation, integration and pilot check of items was the involved process here. Reliability and Repeatability: Cronbach’s alpha was 0.724, which tested for internal consistency. The test-retest reliability was indicated by Intra class correlation, with a value of 0.628. Both the results were above 0.70, reporting a good reliable and repeatable result for this questionnaire.

Discussion: This study reported a good reliability and repeatability of translated Kannada, 14 itemed Mc Monnies dry eye questionnaire. 0.724 value of Cronbach’s alpha tested for internal consistency showed a greater strength. The test-retest reliability used for Intra class correlation reported a value of 0.628 showing good test-retest reliability.

A symptom questionnaire is an important tool used to quantify and qualify the impact of a disease on a patient’s related quality of life and to estimate the prevalence of a certain condition within a population.

A study by Castro J et al 4 reported the process of translating symptom questionnaire from DEWS (Dry Eye WorkShop) to Portuguese and back translating the dry eye symptom questionnaire, comparing the results of the initial application and the re-administration of this questionnaire to a sample of 30 individuals indicated excellent concordance in results, repeatability, and reliability. This process was incorporated in this study as well.

A study by Pakdel et al 5 developed and validated a Farsi version of Ocular Surface Disease Index (OSDI) for the Iranian population. Four bilingual (English-Persian) individual including three physicians and one native English teacher were asked to translate the original English OSDI questionnaire in Farsi. Following
back and forth translation, integration and pilot check, the translation team came to consensus on translation. As a result the Farsi-OSDI showed acceptable internal consistency and test-retest reliability. Similar method of translation and validation was used in this study.

Dry eye, a multifactorial disease with varied severity of discomfort hindering the daily tasks performance with compromised quality of life can be well diagnosed now with this translated Kannada McMonnies questionnaire in the state language of Karnataka. This will further assist the clinician in planning the management of dry eye condition and thus improving the quality of life.

**CONCLUSION**

The results show that the translated and validated McMonnies questionnaire have good internal consistency and test-retest reliability. This symptom based questionnaire can be administered among Kannada speaking population to check for the severity condition and plan for effective management.

This article is an original material. It has not been published in any other journal.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**REFERENCES**


Vitamin D Levels in Late Pre-Term Neonates and its Association with Sepsis

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¹Junior Resident, ²Professor, ³Assistant Professor Department of Paediatrics, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, ⁴Associate Professor Department of Paediatrics, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education

ABSTRACT

Vitamin D deficiency is a major health concern & prevalence rates in preterm neonates is still not well defined. Role of Vitamin D deficiency in critically ill patients with sepsis has been reported in the adult population. This study aims at studying Vitamin D levels in late preterm neonates and its association with sepsis.

Objectives: To estimate & identify Vitamin D deficiency in late Pre-termers, in turn studying their levels in late onset sepsis and estimating the change in Vitamin D levels with the onset of sepsis.

Methodology: A total of 120 late pre-termers were included in the study. Gestation age calculated by New Ballard’s score. Structured pro-forma recorded birth details. Baseline vitamin D levels of all babies were obtained on day 4). Those 67 neonates with features of late onset sepsis either clinically/haematological/culture were sub-grouped as cases & remaining 53 were controls. Subsequent vitamin D level was estimated in septic cases after 48 hours of onset.

Results: Mean value of vitamin D on day 4 was 18.9 indicating vitamin D deficiency (p<0.001). There was no difference in baseline vitamin D levels in those who developed sepsis and those who did not. Amongst cases, mean value of Vitamin D before onset of sepsis was 26.27ng/ml and 19.29ng/ml after 48 hours of onset; indicating a highly significant drop in vitamin D within 48 hours of onset of sepsis (p<0.001). There was no significant association between culture proven sepsis & vitamin D deficiency. Vitamin D deficiency does not predispose to sepsis.

Conclusions: There is need to establish normal Vitamin D levels in our population. There is no evidence in this study to say Vitamin D deficiency predisposes to sepsis. However there is significant drop in vitamin D levels with onset of sepsis.

Keywords: Vitamin D, Late Preterm neonates, Late onset sepsis.

INTRODUCTION

Vitamin D or 25-hydroxyvitamin D is a pre-prohormone which has complex effects on metabolism and immune function, beyond bone and calcium metabolism. Vitamin D is synthesized from 7-dehydrocholesterol in the skin. Vitamin D binding protein transports the vitamin D3 to the liver where it is hydroxylated to 25(OH)D (the inactive form of vitamin D) & then hydroxylated by the enzyme 1-alpha-hydroxylase to its active form 1,25(OH)₂D in the kidneys. This enzyme exerts its action in various extra-renal sites, including osteoclasts, skin, colon, brain, and macrophages. The half-life of vitamin D in the liver is approximately 3 weeks. Serum concentration of 25(OH)
D is the best indicator for judging the vitamin D status in patients with vitamin D-related disease states. Vitamin D deficiency has been historically defined and recently recommended by the Institute of Medicine (IOM) as a 25(OH)D of less than 20 ng/ml. Vitamin D insufficiency has been defined as a 25(OH)D of 21–29 ng/ml. It has been estimated the serum 25(OH)D levels of 20 ng/dL meet the needs of at least 97.5% of population across all age groups in developed countries. Hence it has been concluded by IOM that 25(OH)D levels >20ng/dL indicates vitamin D sufficiency. Levels of 25(OH)D that are 15 ng/dL or less are considered as deficiency and 5 ng/dL or less are considered as severe deficiency1.

MATERIALS AND METHOD

The study was a prospective case control study, conducted at a tertiary care hospital NICU, Mangalore, India. The study included all preterm neonates born between 34 to less than 37 weeks period of gestation (late preterm neonates). Those late preterm neonates who crossed 37 weeks of gestation at the onset of sepsis were excluded from the study. A total of 120 late pre-terms were included in the study after obtaining clearance from the Ethical committee. Gestation age was calculated by New Ballard's score. Structured pro-forma recorded birth details, clinical evaluation, and all hematological investigations. Baseline vitamin D levels of all babies were obtained on day 4 (to exclude confounding maternal factors and early onset sepsis). Those 67 neonates with features of late onset sepsis either clinically/hematological/culture were sub-grouped as cases & remaining 53 were taken as controls. Subsequent vitamin D level was estimated in septic cases after 48 hours of onset. Vitamin D levels were analyzed using ELISA kits. Vitamin D status of pre-termers were defined as per US Endocrine Society Classification.

Results were analysed using SPSS software version 17.0. Associations were derived using Chi Square and Fischer’s exact test. A p value of <0.05 was considered significant.

RESULTS AND ANALYSIS

A total of 120 preterm neonates were taken into the study after satisfying inclusion and exclusion criteria. All preterm babies included in the study were matched for gestational age (34-36 weeks). Majority of the preterm neonates were male babies (61.67%) & a significant proportion of the study group belonged the Hindu community(77.5%)(p<0.001). The study had 69.2% of the babies being born to primigravida mothers and 30.8% of them to multigravida mothers.

In the study group, the mean value of vitamin D on day 4 was 18.9 + 6.009 indicating vitamin D deficiency (p<0.001). A total of 70 % of all the preterm neonates in the study were Vitamin D deficient & 86.6 percent of the total had their vitamin D levels in the deficiency/insufficiency range. Retrospectively Vitamin D levels were analysed between cases and controls and there was no statistical difference between the two subgroups.

Out of the cases analysed 62.7% were males and 37.3 % were females. Out of the 67 cases, 76.2% had Vitamin D deficiency/insufficiency & 23.8% were sufficient in Vitamin D levels.

A total of 39% of the cases isolated organisms in their blood cultures. More than half of the blood cultures isolated Gram negative organisms. Out of the 26 cases which isolated organisms in blood cultures, 65.38% were Vitamin D deficient/insufficient and 34.62% were sufficient in Vitamin D levels. There was a statistically significant relationship between blood culture proven (Gram Negative) Sepsis and Vitamin D deficiency/insufficiency indicating a significant association between culture proven sepsis and vitamin D deficiency (p=0.036). (Table 1)

There was no significant relation between vitamin D levels and CRP levels before and after the onset of sepsis in the cases. Similarly there was no relation between neutropenia and Vitamin D levels in the cases. In the preterm neonates with late onset sepsis (cases), 92.5% of them survived and 7.5 percent of them expired (no statistical significance). Only 7.9% of the cases who had vitamin D deficiency/insufficiency expired. There was no difference in baseline vitamin D levels in those preterm neonates who developed sepsis and those who did not. Of the cases, 76.11% of them were Vitamin D deficient/insufficient and 23.89% had sufficient levels of vitamin D.

The mean value of Vitamin D in the septic neonates (cases) before the onset of sepsis was 26.27ng/ml and 19.29ng/ml after 48 hours of onset. There was a highly significant drop in the levels of vitamin D within 48 hours of onset of sepsis (p<0.001).
Figure 1: Average Vitamin D levels in study group

Table 1: Vitamin D Deficiency and type of organism in Blood culture

<table>
<thead>
<tr>
<th>Culture Positive</th>
<th>25 OH Vit D (ng/ml)</th>
<th>DEFIENCY /INSUFFICIENCY</th>
<th>SUFFICIENCY</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungal</td>
<td></td>
<td>3 (33.3%)</td>
<td>6 (66.7%)</td>
<td>9 (100.0%)</td>
</tr>
<tr>
<td>Gram negative</td>
<td>11 (78.6%)</td>
<td>3 (21.4%)</td>
<td></td>
<td>14 (100.0%)</td>
</tr>
<tr>
<td>Gram positive</td>
<td>2 (100.0%)</td>
<td>0 (0.0%)</td>
<td></td>
<td>2 (100.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>16 (64.0%)</td>
<td>9 (36.0%)</td>
<td></td>
<td>25 (100.0%)</td>
</tr>
</tbody>
</table>

Fishers exact test p=.036, sig.

Table 2: Vitamin D levels at onset of sepsis and 48 hours later

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>diff</th>
<th>diff(%)</th>
<th>Wicoxon signed rank test p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 OH Vit D (ng/ml)-before</td>
<td>26.27</td>
<td>22.37</td>
<td>6.98</td>
<td>26.59</td>
<td>0.000&lt;0.001, HS</td>
</tr>
<tr>
<td>25 OH Vit D (ng/ml)-after</td>
<td>19.29</td>
<td>11.78</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

McNemer test p=.000<0.001, HS
**DISCUSSION**

Vitamin D deficiency is becoming a major health concern & although prevalence rates in preterm neonates is still not well defined, in reality may be very high. Literature on Vitamin D levels in preterm neonatal sepsis are sparse in India. Alok Sachan et al observed a high prevalence of vitamin D deficiency in pregnant mothers and newborns from India, a country with abundant sunlight.

In our pilot study of vitamin D levels in late preterm neonates and its association with sepsis, the mean value of vitamin D estimated on day 4 was 18.9 indicating vitamin D deficiency (p<0.001). Dijkstra H S et al in their study on ‘High prevalence of vitamin D deficiency in newborn infants of high-risk mothers’ showed a high prevalence (42.5%) of newborns being vitamin D deficient, considering serum 25-hydroxyvitamin D <25ng/ml as deficiency.

However, Alok Sachan et al reported a low mean value of vitamin D (8.4±5.7 ng/ml) in 95.7% of neonates, considering serum 25-hydroxyvitamin D <20 ng/ml as deficiency. As our observation is in concordance with other studies, more studies are required to set normal Vitamin D levels in newborns in our country in general, & preterm neonates in particular.

Studies in adult population have reported an association between low levels of vitamin D and sepsis -

A prospective cohort study by Ginde. Et al in 2011, of adults admitted from Emergency Department with suspected infection showed 79 % of them having Vitamin D <30ng/ml with increased severity of sepsis at admission and at 24hours.

A Case-control study by Jeng et al in 2009, reported plasma vitamin D & vitamin D binding protein concentrations were significantly lower in critically ill subjects with sepsis compared to critically ill subjects without sepsis. In our study, there was no difference in baseline vitamin D levels in those preterm neonates who developed sepsis and who did not. However all the vitamin D deficient neonates did not acquire sepsis, raising questions whether Vitamin D deficiency is a risk factor for sepsis in contrast to adults.

There was a significant drop in vitamin D levels(p<0.001) in those preterm neonates who developed sepsis(26.27ng/ml at the onset of sepsis and 19.29ng/ml 48 hours later). Half life of Vitamin D is around 3 weeks & biological degradation of Vitamin D cannot be resulting in such a rapid fall in 48 hours.

Our study showed a significant association between Gram negative sepsis and Vitamin D deficiency in preterm neonates (p=0.036); whether this association is a ‘cause or effect’ needs to be established. Sadegi et al demonstrated that human monocytes stimulated with LPS (produced by Gram negative bacteria) & treated with Vitamin D(1,25 (OH)D) showed a dose dependant decrease in inflammatory markers of sepsis. These effects were reversed with introduction of VDR antagonists, thus reinforcing a key role of Vitamin D in the signalling mechanisms of Gram Negative organisms.

It is known that hypocalcaemia and increased levels of calcitonin precursors are common in critically
ill patients especially those with sepsis. Muller B. et al studied a positive association of raised calcitonin precursors in sepsis with hypocalcaemia, however there was no significant change in circulating Vitamin D levels during sepsis⁴. Our study did not document hypocalcaemia in any of the babies in view of supplemental calcium prophylactically administered preterm neonates as a unit protocol.

**CONCLUSIONS**

Majority of the preterm neonates in the study group were vitamin D deficient. There was a significant drop in vitamin D levels within 48 hours, in those preterm neonates who developed sepsis. In our study, Vitamin D deficiency was not a risk factor for sepsis in preterm neonates. There is a strong correlation between vitamin D deficiency & Gram Negative Sepsis.

**Ethical Clearance**- Taken from institutional ethics committee

**Source of Funding**- Self

**Conflict of Interest** - Nil

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Interprofessional Assessment of Accessibility to Public Buildings by Individuals with Visual Impairment: A Report from Udupi Taluk – A Pilot Study

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ABSTRACT

Background: Built environment majorly influences the accessibility of a differently abled person. Under the preface of the initiative of Accessible India campaign from the Government of India to build an accessible environment, this study aimed to conduct systematic audits of various public places commonly accessed by people.

Objective: To audit a few public sector offices with the aid of a standardized checklist and understand the extent of barrier-free, safe built-in environment for the visually impaired.

Method: An interprofessional team comprised of members who had experience in fields such as accessibility, ergonomics & workstation research such as professionals from architecture, vision care, physiotherapy and occupational therapy carried out on-site audits, compiled data and finalized the reports. We used a comprehensive audit checklist for assessing accessibility to public buildings by individuals with visual impairment. Investigators purposively selected four buildings (District civil court, District Commissioner’s office, an insurance office and nationalized bank) for the audit in a time span of 6 months.

Results: The audit reports were categorized as circulation spaces, building facilities and communication and information for each public building. The overall adherence to accessibility standards was 18%, 35%, 21% and 14% at District court, District Commissioner’s office, an insurance office and nationalized bank respectively.

Key-words: Built environment, visually impaired, mobility, interprofessional team, audit, accessibility

INTRODUCTION

Built environment majorly influences the accessibility of a differently abled person. A direct association between the living or working space and safe mobility safety is well addressed. As per World Health Organization (WHO), “Disability is a complex phenomenon reflecting the interaction between features of a person’s body and features of the society in which he or she lives. Overcoming the difficulties faced by people with disabilities requires interventions to remove environmental and social barriers”. Low vision and total blindness are the leading causes for visual disability according to the Persons with Disability Act 1995 (PWD). In a study conducted in Jhajjar district of north India, the prevalence of visual impairment was 24.5% (95% CI 21.1 to 26.3) and blindness was 5% (95% CI 3.9 to 6.1). Environmental interactions influence the safety, mobility and overall participation of individuals with visual impairment (IWVI). IWVI are prone for

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higher incidences of falls and other safety concerns due to environmental concerns. Numerous advocacy groups recommend that public health agencies need to identify environmental factors that may enhance or impede participation of IWVI. Understanding the needs of IWVI and analysing the built environment may help in mitigating the barriers towards participation.

Government of India has launched “Accessible India Campaign (Sugamya Bharat Abhiyan)”, a flagship programme and nation-wide campaign to create barrier free environment for person with disabilities. It targets on creating physical infrastructure, accessible and inclusive for persons with disabilities and also attempts in making public buildings, transport system and communication technology accessible to all. Government of India has harmonized guidelines and standards for barrier free environment for elderly and persons with disability. The program assures undertaking access audits for all existing buildings under central government and provide retrofitting to make them inclusive.

Interactions of an individual with environment is multifaceted and hence it needs the views and understanding of multiple professionals and stakeholders. The combined efforts of architects, designers, health care providers and planners are essential in providing a user friendly built environment for people with disabilities. With this need, this study aimed to audit and understand the available facilities at public buildings using an interprofessional team with a focus on needs of IWVI.

Methods:

Procedure:

A team of professionals specialized in research related to ergonomics considered the validated comprehensive survey list from the Indian Institute of Architects, Nagpur chapter and planned for the on-site audit surveys by including required points from the survey list. This interprofessional team comprised of optometrist, physiotherapist, occupational therapist and architects. Formal meetings were conducted to sensitize them on the need of study and the importance of interprofessional practice towards holistic community care. We also discussed various activities involved in project along with their role as a participant. The study was approved by the Institutional Research Committee, SOAHS, MAHE. Since this study did not involve any human subjects, a waiver was obtained from the Institutional Ethical Committee, Kasturba Hospital.

The most commonly accessed public buildings providing a variety of services were selected using purposive sampling. Administrative permissions from the building officials were obtained. We categorized the buildings under government offices and banks/insurance offices. The team audited District Court, District Commissioner’s office, Life Insurance office and a nationalized bank in Udupi taluk. The facilities were audited using this checklist and supportive photos were clicked as evidence to the activity.

RESULTS

The buildings assessed under this audit were categorized based on the features. Assessment was undertaken only of those areas accessed or permitted to be accessed by community. The audit report was categorized to 3 sub-sections; circulation spaces, building facilities and communication and information. Circulation spaces are areas that provide access to all the spaces within a building. In this study horizontal and vertical circulation spaces available in each building was assessed. A building has specific features that provide services as per the typology of a building. Hence, service facilities at each building was considered for the audit. The overall compliance to CPWD guidelines are 18%, 35%, 21% and 14% for District court, District commissioner’s office, Life insurance office and nationalized bank respectively. In reference to information and communication, none of the buildings had facilities such as braille scripts, emergency exits, signage with LED etc.
DISCUSSION

We found lack of compliance to basic amenities in these four buildings. Though mentioned in the CPWD guidelines, most of the basic amenities were absent in these facilities. Access pathway components was fairly compliant in most of facilities. Lack of properly identifiable staircases, guiding strips was found. One of the community buildings, an important government office having a wide population of people using lacked the lift facility. The steps was unscientifically structured and most of the office proceedings were held either in first floor or second floor. People with disability and elderly had lot of difficulty in moving around. Toilets were also no properly designed and most of the facilities had faulty, non-maintained structures in all the four buildings. The audit report shows that the compliance percentages at extreme values with majority as not compliant at all. Certain features if available have been documented as 100% like availability of elevators or

Graph 1: The number of buildings adopting the set characteristics under circulation spaces as mentioned in the survey list.

Graph 2: The number of buildings adopting the set characteristics under building facilities as mentioned in the survey list.
drinking water facilities. The most compliant features were the horizontal circulation spaces including corridors, access routes, and entrance and exit pathways. However, considering the requirement for individuals with visual impairments, there is lack of compliance. This can be understood from lack of availability of guiding pathways, audio tracking, and braille maps and guides. Information and communication are the least compliant features in all the public buildings assessed. Lack of access friendly spaces in public buildings have hindered participation of individuals with visual impairments. Access to public buildings is an essential requirement for empowerment of individuals with disabilities.

These findings are in line with a study performed on functional aspects to public buildings and facilities wherein the authors suggested that knowledge of such barriers and facilitators is crucial in improving the environmental access. 3

**Limitations and future implications:**

Though the investigators requested for assessment of all features in these public buildings, permission could be obtained only for specific areas. The audit method used can be reported in the format of compliance percentage. Though this report gives an insight that there has to be focused work towards accessibility in public buildings, efforts are required to understand the needs of users which varies with percentage of impairments, age, functional abilities and use of assistive devices.

**Conflicts of Interest:** None

Acknowledgment: This research was conducted during the primary author’s M-FIILIPE (MAHE FAIMER International Institute for Leadership In Interprofessional Education) fellowship program. Authors here thank the mentors from M-FIILIPE who provided insight in the output of this paper.

**Source of Funding:** Self-funding

**Declaration of Interest Statement**

There is no Conflict of Interest encountered. This study hasn’t received any financial support.

**Originality:** This article is an original material. It has not been published in any other journal.

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Assessment of Hand Washing Practices among School going Children- A Cross Sectional Study from India

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ABSTRACT

Background: Hand washing plays a pivotal role in the containment of various diseases and infections among school going children. With proper knowledge and education children should be encouraged to follow good hand washing practices from an early stage of their life.

Study design: School based cross-sectional study

Method: Data were collected using interview questionnaires and hand washing facilities inspection was also done using observation checklist. Data was entered and analyzed by EpiData software version 2.2.2.186 and Stata analysis software.

Results: Study participants had proper knowledge of hand washing and also practiced the same.

Conclusions: Our study revealed that good number of study participants practiced hand washing behavior. Availability and accessibility of water and soap all the time will further achieve good compliance of hand washing practices among school children.

Keywords: Good compliance, Infection rate, Hand washing practice, predisposing factors

INTRODUCTION

Hand hygiene is regarded as one of the most important element of infection control activities. Increasing severity of illnesses and complexity of treatment, stress the need for reversing back to the basics of infection control by simple measures like hand hygiene1,2. Superimposed by pathogens, contaminated hands play a major role in the transmission of the fecal-oral transmission of the diseases3,4,5.

Children tend to contaminate their hands more frequently compared to adults. Also, children suffer disproportionately more with diarrheal and respiratory illnesses6,7. Washing hands with soap is the most common and inexpensive method to get rid of the microorganisms8.

Schools play a major role in inculcating the good habits among children. Proper knowledge and education regarding the good practices of hand washing and hand hygiene at the school level itself will make the students live a healthy and disease free life in the long run9.

Washing hands frequently reduces the overall burden of potential pathogens from the hands; thereby reducing the transmission of illnesses like diarrhea and respiratory diseases. Effectiveness of hand washing is achieved better when it is a regular practice to wash hands with soap before meals and after defecation10,11.

Lack of resources like availability of soap and clean water facility paves way for acquiring communicable diseases more easily among school children. Inadequate knowledge and poor hand hygiene practices also play a major role in increasing the burden of intestinal parasitic...
infections among school children especially in the developing countries.

Our study was intended to find out the existing knowledge and attitude of the school children towards the relevance of washing hands and also the use of soap. Addressing the issues like hand hygiene and infection control from a younger age has to be an integral part of daily routine.

MATERIALS AND METHOD

Present study was carried out in the Department of Microbiology, for a period of two months from July to August 2017. The school was located 10 km from our Institution (Sri Venkateshwar Medical College Hospital and Research Centre) at Kandamangalam, Tamilnadu.

A school based cross-sectional study involving quantitative method was adopted among the randomly selected students. The study population included students in grades 6, 7 and 8 during the 2017 academic year.

Sample size determination and sampling procedure

Considering the proportion of ideal hand washing time 90.5% 8, 95% confidence interval, designs effect-1 and 10% of non-response, the sample size was calculated using OpenEpi software as 133. Multistage sampling technique was used to select the study subjects. Eligible students were selected using simple random sampling technique.

Data quality management

Data quality was ensured at every stage like during collection, coding, entry and analysis. The filled questionnaires were checked for completeness and consistency on a daily basis.

Data processing and analysis

Data was analysed by Epidata Software version 2.2.2.186 and by Stata analysis software. Descriptive analyses were performed for all the variables. Bivariate analysis was performed to observe the crude relationship between the independent variables and the outcome variable. Multivariate logistic regression was also performed on the final analysed data to identify the independent effects of significant variables. P value less than 0.05 were taken as significant.

Measurement

Based on the data collected via questionnaire, hand washing practice was assessed based on two criteria i.e. hand washing with soap after using toilet and hand washing with soap before eating. The 5 frequency table as prepared and dichotomized wherein those who answered 1=always to 2=very often were classified as washers (scale 0) and 3=often to 5 =never were classified as non-washers (scale 1). These dichotomized items were added up to create summative index point wherein students who reported 1=always to 2=very often for both criterion were classified as in proper hand washing category.

Knowledge on hand washing was assessed based on six questions related to infectious diseases and their transmission; critical times of hand washing; health outcome associated with hand washing. In each item, those who answered correctly scored 1 and those who answered incorrectly will score 0. Those who scored 3 and more were classified as having sufficient knowledge and those who scored 2 and less were classified as having insufficient knowledge regarding hand washing practice.

Attitude towards hand washing was assessed based on the belief about hand washing with soap using5 point Likert scale. The scale ranging from 1=strongly disagree to 5=strongly agree was dichotomized and was added up to create summative index. Students were classified as having positive attitude towards hand washing practice if they answered 1=strongly disagree or 2=disagree whereas students were classified as having negative attitude towards hand washing practice if they answered 3=neutral to 5= strongly agree.

Ethical consideration

The study was started after obtaining the consent from the Institutional Ethics Committee and prior permission from the Dean of the college and Principal of the School was obtained for the study.

RESULTs

The study included 133 school going children who belonged to the age group 9-12 years. As per their educational status, 39 (29.3%) belonged to grade five. Among the total participants, 83 (62.4%) of children were males and 75 (56.4%) were from urban areas. 42 (31.6%) of the study participant’s family occupation was civil servant and 86 (64.7%) of the student’s parents
were educated (Table 1).

Table 1: Socio-demographic characteristics of the study participants (N=133)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 years</td>
<td>39</td>
<td>29.3</td>
</tr>
<tr>
<td>10 years</td>
<td>35</td>
<td>26.3</td>
</tr>
<tr>
<td>11 years</td>
<td>24</td>
<td>18.0</td>
</tr>
<tr>
<td>12 years</td>
<td>35</td>
<td>26.3</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>83</td>
<td>62.4</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>37.6</td>
</tr>
<tr>
<td>Grade of students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade five</td>
<td>39</td>
<td>29.3</td>
</tr>
<tr>
<td>Grade six</td>
<td>35</td>
<td>26.3</td>
</tr>
<tr>
<td>Grade seven</td>
<td>24</td>
<td>18.0</td>
</tr>
<tr>
<td>Grade eight</td>
<td>35</td>
<td>26.3</td>
</tr>
<tr>
<td>Residency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>75</td>
<td>56.4</td>
</tr>
<tr>
<td>Rural</td>
<td>58</td>
<td>43.6</td>
</tr>
<tr>
<td>Family occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil servant</td>
<td>42</td>
<td>31.6</td>
</tr>
<tr>
<td>Farmer</td>
<td>27</td>
<td>20.3</td>
</tr>
<tr>
<td>Shop owner</td>
<td>38</td>
<td>28.6</td>
</tr>
<tr>
<td>Daily laborer</td>
<td>26</td>
<td>19.5</td>
</tr>
<tr>
<td>Parent’s educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educated</td>
<td>86</td>
<td>64.7</td>
</tr>
<tr>
<td>Uneducated</td>
<td>47</td>
<td>35.3</td>
</tr>
</tbody>
</table>

Hand washing practice

Among all the children, 86 (64.7%) and 75 (56.4%) of them washed their hands with soap after using toilet and before eating respectively. According to the criteria defined in the measurement, proper hand washing practice was performed by 91 (68.4%) of the children (Table 2).

Table 2: Hand washing practice of school going children (N=133)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing hands with soap after using toilet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>64.7</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>35.3</td>
</tr>
<tr>
<td>Washing hands before meal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>75</td>
<td>56.4</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
<td>43.6</td>
</tr>
<tr>
<td>Hand washing practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper</td>
<td>91</td>
<td>68.4</td>
</tr>
<tr>
<td>Improper</td>
<td>42</td>
<td>31.6</td>
</tr>
</tbody>
</table>

Predisposing factors (knowledge and attitude) for school children’s hand washing practice

According to the measurement criteria defined for knowledge of hand washing practice, 80 (60.2%) were found to have sufficient knowledge whereas 53 (39.8%) had insufficient knowledge. Similarly, 88 (66.1%) children had positive attitude towards hand washing while 45 (33.9%) showed negative attitude towards hand washing practice (Table 3).
Table 3: Predisposing factors for school children’s hand washing practice (N=133)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can germs be acquired when desks, door, books and animals are touched?</td>
<td>Yes: 92</td>
<td>69.2</td>
</tr>
<tr>
<td></td>
<td>No: 41</td>
<td>30.8</td>
</tr>
<tr>
<td>Do poor hand washing cause diseases?</td>
<td>Yes: 76</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>No: 57</td>
<td>42.9</td>
</tr>
<tr>
<td>Is water only enough for hand washing?</td>
<td>Yes: 84</td>
<td>63.2</td>
</tr>
<tr>
<td></td>
<td>No: 49</td>
<td>36.8</td>
</tr>
<tr>
<td>Is hand washing with soap needed after coughing or sneezing</td>
<td>Yes: 85</td>
<td>63.9</td>
</tr>
<tr>
<td></td>
<td>No: 48</td>
<td>36.1</td>
</tr>
<tr>
<td>Is failure to wash hand transmits infectious diseases?</td>
<td>Yes: 90</td>
<td>67.7</td>
</tr>
<tr>
<td></td>
<td>No: 43</td>
<td>32.3</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Sufficient: 80</td>
<td>60.2</td>
</tr>
<tr>
<td></td>
<td>Insufficient: 53</td>
<td>39.8</td>
</tr>
<tr>
<td>If you wash your hands really well with water you don’t need to use soap?</td>
<td>Yes: 91</td>
<td>68.4</td>
</tr>
<tr>
<td></td>
<td>No: 42</td>
<td>31.6</td>
</tr>
<tr>
<td>You only need to wash your hands with soap if they look dirty or smell bad?</td>
<td>Yes: 97</td>
<td>72.9</td>
</tr>
<tr>
<td></td>
<td>No: 36</td>
<td>27.1</td>
</tr>
<tr>
<td>Is washing your hands with soap is important before eating?</td>
<td>Yes: 77</td>
<td>57.9</td>
</tr>
<tr>
<td></td>
<td>No: 56</td>
<td>42.1</td>
</tr>
<tr>
<td>Attitude</td>
<td>Positive: 88</td>
<td>66.1</td>
</tr>
<tr>
<td></td>
<td>Negative: 45</td>
<td>33.9</td>
</tr>
</tbody>
</table>

Enabling factors for children’s hand washing practice

The school chosen for our study had twenty toilets. From this toilets, 15 (75%) of them had hand washing station which was placed outside the toilets. Among all the washing station only water supply was present at the time of observation and no soap facility was available for washing the hands.

Factors affecting hand washing practice among school children

When data was analyzed by multivariate logistic regression analysis using STATA software, family occupation and parent’s educational status was statistically significant. From the socio demographic profiles of the school children, children whose parents belonged to farmer category showed significant association with proper hand washing (AOR: 7.07, 95% CI: (1.72, 29.11)). Similarly, school children whose parents were educated performed proper hand washing practice when compared with the uneducated category (AOR: 42.73, 95% CI: (1.96, 929.37)).

Discussion

Our school based cross-sectional study with the objective of assessing the proper hand washing practice among the school going children was conducted in Kandamangalam town, in Tamilnadu. The results from our study showed a good proportion (68.4%) of school children had proper hand washing behavior whereas the rest (31.6%) of children showed improper or poor hand washing behavior. The findings of the study were in contrast with the other studies wherein the results showed poor rate of hand washing practice among school children^{14, 15}.

Participants in our study were from both urban and rural area wherein majority 56.4% were from the urban area. Though residency plays an important role in proper hand washing, in our study we could not find it statistically significant as reported in a study from Ethiopia^{14}.

Among the many factors, the key predictor of hand washing practice among school going children was parent’s educational status. In this regard, children whose parents were educated showed statistically significant result with proper hand washing practice behavior when compared to the children whose parents
were uneducated. This could be due to the high level acceptance of national initiatives like hand washing practices by the parents and their children. Also, in our study a statistical significant association was found for proper hand washing practice among the children whose parents were in the family occupation of Farming (farmers).

The other factor for proper hand washing practice in children was easy accessibility of water and soap at school and at home. In this study, the unavailability of resources like soap was found to be preventive factors for children adopting improper hand washing practice. This finding was in line with other studies done from different parts of world. Also, WHO recommended that hand washing with soap is one of the most important hygiene behaviors which should be promoted among school children.

Our study findings indicate majority of them had sufficient knowledge about important aspects of hand washing practice which was in accordance with the study from Odisha, India. In the same manner, attitudes, which also reflect the degree of positive or negative behavior of an individual, were not found to be statistically important in predicting hand washing practice in our study. The attitude of a person is shaped by the salient beliefs, various perception and subjective value of the outcome result which could affect the hand washing practice.

According to the WHO guidelines, for an effective school WASH, one toilet per 25 girls and one toilet plus one urinal per 50 boys is required. These toilets should be hygienic, easy to clean and should have convenient hand washing facilities. But in our study only 20 toilets were available during observation for the use of the students.

Hands are the primary vehicle in the transmission of various diseases affecting the whole family. Since scarcity of soap was noticed in our study with agreement to another study done in Mauritius, which in turn acts as a preventive factor among school children in adopting proper hand hygiene practices. Furthermore, school children should be often educated on the importance of hygienic practices in the day to day life.

**CONCLUSION**

The findings from our study showed a higher number of participated school children had proper hand washing practice behavior. The independent predictors of hand washing practices were family occupation and parent’s educational status. Fulfilling the availability of water and soap for hand washing at all the places and all the time can further diminish the percentage of improper hand washing practices among the school going children.

**Conflict of Interest:** None

**Source of fFunding:** Self

**REFERENCES**


8. Anant Arunrao Takalkar, Abhay Subhashrao


The Behavior of Fertile Women in Rural Areas toward the Acetic Acid Visual Inspection

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ABSTRACT

Background: Most patients diagnosed with cervical cancer in Indonesia are at an advanced stage. Therefore, it is important to do early detection of cervical cancer. Maternal and Child Clinic at health clinics in Lampung stated that the coverage of acetic acid visual inspection test was smaller than the target of 10% per year. The purpose of this research was to know the risk factors related to the behavior of women of fertile age in acetic acid visual inspection test.

Method: This research was designed using analytic analysis with a cross-sectional approach. The study population was all fertile women who became the target of acetic acid visual inspection test at a health clinic in Pringsewu Regency, Lampung Province, Indonesia and the multiple logistic regression was employed to examine the relationship.

Results: Results of the test showed that the p-values of knowledge, attitude, family support, perception, and medics support were 0.002, 0.037, 0.037, 0.731, 0.9333 respectively on the behavior of women in a fertile age in acetic acid visual inspection test implying that knowledge variable is the most dominant variable.

Keywords - Acetic acid visual inspection, behavior, fertile age, risk factors

INTRODUCTION

Cervical cancer is a malignant tumor that grows inside the cervix or an area of the female reproductive organs. Cervical cancer is characterized by the unusual growth of cells in the cervix¹. The effects of cervical cancer are bleeding, anemia, abortion, and premature partus if suffered by pregnant women, abnormal vaginal discharge, and immune system disorders. It was estimated that there were 528,000 new cases of cervical cancer and 266,000 deaths from cervical cancer. The high incidence of cervical cancer in Indonesia was because most patients diagnosed with cervical cancer were at an advanced stage². This becomes a significant reason for the early detection of cervical cancer. The early detection of cervical cancer by acetic acid visual inspection test method in Pringsewu Regency, Lampung Province in 2016 was 169 people (0.2%) from 84,449 women aged 30-50 years with positive results of 17 people (10.1%). In 2015, coverage of early detection of cervical cancer by acetic acid visual inspection test method in Pringsewu Regency, Lampung Province was equal to 158 people (0.19%) from 82,477 women age 30-50 years with positive results equal to 15 people (9.5%). The low participation of women in a fertile period in conducting acetic acid visual inspection test at health clinics in Pringsewu Regency, Lampung Province was due to the low knowledge of fertile women on acetic acid visual inspection test. This was because the majority of mothers are working; thus they were less active to seek for information about acetic acid visual inspection test. The lack of knowledge will affect the attitude of the fertile women who consider the acetic acid visual inspection test less essential to do as well as change the

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perception of fertile women in giving meaning about the importance of acetic acid visual inspection test\(^{(3)}\). The lack of participation in acetic acid visual inspection test is also related to support of medics and family in motivating fertile women to perform acetic acid visual inspection tests. The purpose of this research was to know the risk factors related to the behavior of women of fertile age in acetic acid visual inspection test.

**METHODOLOGY**

This research was a quantitative research type. The design of analytic research with cross-sectional approach was used to find the risk factor analysis related to the behavior of fertile women in acetic acid visual inspection test. The study was conducted in March until August 2017. The research was done at health clinics in Pringsewu Regency, Lampung. The sample size was 361 samples taken by quota sampling\(^{(4)}\).

Knowledge data collection tool was a sheet of instrument test. Attitude, perception, and family support data collection tool in this study was a questionnaire that contains 10 questions using a Likert scale. Each question item has 4 alternative answers which were: strongly disagree (1), do not agree (2), agree (3), and strongly agree (4). Medics support data collection tool was questionnaire containing 10 questions which have 2 alternatives “yes” (0) and “no” (1) answers. To get the score 2 option score ranging from 0-1 were employed where score 0 for the response of yes and score 1 for no response. The multivariate test was done using multiple logistic regression tests\(^{(5)}\).

**RESULTS**

Table 1 shows the frequency distribution of the behavior of fertile women in acetic acid visual inspection test. Based on Table 1, it is known that most fertile women did not do the acetic acid visual inspection test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage%</th>
</tr>
</thead>
<tbody>
<tr>
<td>The behavior of Fertile Women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doing acetic acid visual inspection test</td>
<td>97</td>
<td>26.9</td>
</tr>
<tr>
<td>Not doing acetic acid visual inspection test</td>
<td>264</td>
<td>73.1</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>93</td>
<td>25.8</td>
</tr>
<tr>
<td>Less good</td>
<td>268</td>
<td>74.2</td>
</tr>
<tr>
<td><strong>Attitude</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>127</td>
<td>35.2</td>
</tr>
<tr>
<td>Negative</td>
<td>234</td>
<td>64.8</td>
</tr>
<tr>
<td><strong>Perception</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>134</td>
<td>37.1</td>
</tr>
<tr>
<td>Less good</td>
<td>361</td>
<td>62.9</td>
</tr>
<tr>
<td><strong>Family support</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>113</td>
<td>31.3</td>
</tr>
<tr>
<td>Poor</td>
<td>248</td>
<td>68.7</td>
</tr>
<tr>
<td><strong>Medical support</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>219</td>
<td>60.7</td>
</tr>
<tr>
<td>Poor</td>
<td>142</td>
<td>39.3</td>
</tr>
</tbody>
</table>
Table 2 shows the correlation between the variables and the behavior of fertile women in acetic acid visual inspection test. Based on the results on Table 2, it can be inferred that the p-values of knowledge, attitude, family support, perception, and medics support were 0.002, 0.037, 0.037, 0.731, 0.9333 respectively on the behavior of fertile women in acetic acid visual inspection test. This means that knowledge, attitude, and family support have a significant correlation with the response of fertile women in acetic acid visual inspection test while perception and medics support have no significant relationship. Table 2 also shows that knowledge variable is the most dominant variable related to the behavior of fertile women in acetic acid visual inspection test at the health centers of Pringsewu Regency in 2017 with OR obtained of 2.263.

**Table 2: Correlation between the variables and the behavior of fertile women in acetic acid visual inspection test**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Fertile women behavior in doing acetic acid visual inspection test</th>
<th>p-value</th>
<th>Oddity Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Do the test</td>
<td>Do not do the test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Good</td>
<td>37</td>
<td>39.8</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Less good</td>
<td>60</td>
<td>22.4</td>
<td>208</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97</td>
<td>26.9</td>
<td>264</td>
</tr>
<tr>
<td>Attitude</td>
<td>Positive</td>
<td>43</td>
<td>33.9</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>54</td>
<td>23.1</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97</td>
<td>26.9</td>
<td>264</td>
</tr>
<tr>
<td>Perception</td>
<td>Good</td>
<td>38</td>
<td>28.4</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Less good</td>
<td>59</td>
<td>26.0</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97</td>
<td>26.9</td>
<td>264</td>
</tr>
<tr>
<td>Family Support</td>
<td>Good</td>
<td>39</td>
<td>34.5</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>58</td>
<td>23.4</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97</td>
<td>26.9</td>
<td>264</td>
</tr>
<tr>
<td>Medical Support</td>
<td>Good</td>
<td>58</td>
<td>26.5</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>39</td>
<td>27.5</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97</td>
<td>26.9</td>
<td>264</td>
</tr>
</tbody>
</table>

Table 3 shows the interaction test of the predicted model factors. There is no interaction between knowledge variable with attitude variable, and there is no interaction between attitude variable with family support variable (Sig. omnibus = 0.548). Thus, the interaction between knowledge variables with attitude and attitude with family support should be excluded from the model.
Table 3. Interaction test of the predicted model factors

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>P-value</th>
<th>OR</th>
<th>Sig. omnibus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge</td>
<td>0.028</td>
<td>2.133</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Attitude</td>
<td>0.037</td>
<td>1.025</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Family Support</td>
<td>0.032</td>
<td>1.156</td>
<td>0.548</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge with attitude</td>
<td>0.791</td>
<td>1.153</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Attitude with family support</td>
<td>0.214</td>
<td>1.915</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSIONS**

The result of the research shows that the frequency distribution of the behavior of fertile women in acetic acid visual inspection test is higher in the category of not doing which is 264 people (73.1%). It means that there were more fertile women at Pringsewu Regency who did not perform acetic acid visual inspection test to detect cervical cancer early. The result of the research showed that the respondent behavior the less right category supporting previous research (6). On the other hands, a study on the description of the action of fertile women on early detection of cervical cancer in the hospitals of Ponorogo City, East Java Indonesia obtained results that respondents behaved positively (7). According to the researchers, more fertile women in Pringsewu Regency did not do acetic acid visual inspection test because more respondents were less aware of acetic acid visual inspection test, so it affected fertile women behavior not to do acetic acid visual inspection test because they did not know the benefits obtained from acetic acid visual inspection test.

The results obtained that there was no significant relationship between knowledge with early detection of cervical cancer in line with the previous research (8). Knowledge is the result of knowing and it occurred after people did sensing of a particular object through sight, hearing, smell, taste, and touch. Much of human knowledge is obtained through the eyes and ears (9). Knowledge is an impression in the human mind as a result of the use of five senses and different from beliefs, superstition, and misinformation (10). Respondents who have imperfect knowledge about acetic acid visual test will act otherwise to perform acetic acid visual inspection test because the respondents are lack of understanding of the purposes and advantages of the analysis.

There was a relationship between attitude with the behavior of fertile women in the early detection of cervical cancer using the acetic acid method supporting the previous research (11). The women’s positive attitude will form a reasonable view that acetic acid visual inspection test needs to be done to prevent the occurrence of cervical cancer and have a response to decide to do acetic acid visual inspection test.

Perception is the process of recognition of objects (objects, people, ideas, symptoms and events) through the five senses so that it instantly gives meaning and value to an object by highlighting the peculiar nature of an object and the result of perception can in the form of different responses or ratings from individuals (12). The p-value of understanding was 0.713, which means there was no significant relationship between perception with fertile women behavior in acetic acid visual inspection test. The respondent must recognize the object first, which is acetic acid visual inspection test, from the process of knowing through mass media, printed media, and information from health workers about the benefits of acetic acid visual inspection test. A proper perception of the acetic acid visual inspection test will affect the behavior to perform the analysis and vice versa. Fertile women who have poor understanding will influence the behavior of not doing the acetic acid visual inspection test. However, from the results of the study, more respondents do not know about acetic acid visual inspection test. The inability of respondents in identifying the test causes the respondent to do the test without any good perception of the test.
The family is an external factor that has a relationship or non-material support to others. Types of support can be emotional support, physical support, informational support, and awards or communication support. The existence of the family can provide a significant motivation in patients when patients have various problems of life pattern changes that are so complicated and saturated with all health programs (13). Based on the results of the research, there was a significant relationship between family support to the behavior of fertile women in acetic acid visual inspection test with the p-value of 0.037. The value of OR was 1.726 which means that respondents with the right category family support have a chance 1.726 times greater to perform acetic acid visual inspection test than respondents with low-income family support category.

Health worker or medics is someone who is responsible for providing health services to individuals, families, and communities. There are two aspects of the quality of health services that need to be done at the health center that is quality of care and quality of service. Quality of care includes technical skills of health workers (doctors, midwives, nurses, or other paramedics) in establishing the diagnosis and providing care to the patient (14). There is no significant relationship between the support of medics with the behavior of fertile women in acetic acid examination test with the p-value of 0.933. According to the researcher, there was no significant correlation between health officers support and fertile women behavior in doing acetic acid visual inspection test at Pringsewu Regency because health worker has tried as much as possible to support fertile women to perform acetic acid visual inspection test but most of the fertile women still do not do the test. This proved that there was no direct and significant correlation between the support of health workers and the behavior of fertile women in the acetic acid visual inspection test. However, this result is not in line with research about the factors that affect the willingness of fertile women in doing early detection of cervical cancer. The effect of a statistical test using chi-square showed that there was a significant correlation between health officers support (p-value of 0.023) with fertile women willingness in early detection of cervical (15).

**CONCLUSION**

The knowledge variable is the most dominant variable related to the behavior of fertile women in the acetic acid visual inspection at health centers of Pringsewu Regency with OR value of 2.133. It means that respondents with the first category of knowledge have 2.133 greater opportunities for having behavior in performing acetic acid visual inspection test than respondents with the less right type of expertise. According to the researcher, the knowledge variable was the most dominant variable because fertile women’s awareness in the examination of acetic acid visual inspection test did not arise suddenly, but it took time and media in the process of the emergence of such behavior and knowledge was an essential factor. Good knowledge possessed by fertile women will not only affect its behavior but also can affect other individuals because fertile women who already knew the benefit of acetic acid visual inspection test will inform others by doing interaction leading to other fertile women doing acetic acid visual inspection test.

**Ethical Clearance:** The Ministry of Health Polytechnic approved this research in Tanjung Karang, Indonesia. A research permit was requested from the local health authorities.

**Conflict of Interest:** Nil.

**Source of Funding:** The Ministry of Health Polytechnic Tanjung Karang, Indonesia.

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Association of Frequency of Toothbrushing to Periodontal Findings in Elderly Subjects of Dakshina Kannada District

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ABSTRACT

Purpose: The aim of this study was to evaluate the relationship between self-reported toothbrushing frequency to gingivitis and periodontal parameters in a group of elderly males.

Materials and Method: A randomized cross-sectional study of 90 dentate patients aged 60 -75 years old was conducted. The full mouth recording of periodontal pockets and clinical attachment level was done. These periodontal findings indicated the severity of periodontal disease. Data regarding age and toothbrushing habits were collected. Statistical Analysis was done

Conclusion: Brushing twice a day promotes better periodontal health.Hence it very important to educate each and every individual about the advantages of brushing twice daily.

Keywords: Toothbrushing, periodontal pocket, clinical attachment level, periodontitis.

INTRODUCTION

Periodontal disease is of multifactorial etiology. The primary causative agent for periodontitis is dental plaque. Thus controlling this pathogenic plaque is necessary to prevent the periodontal disease.[10] Toothbrushing is an essential activity for promotion of oral health and disease prevention.[5] Among the various methods of preventing periodontal diseases in the oral toothbrushing has proved to be the best method. Few systematic reviews found that brushing twice daily is the best method of preventing periodontal disease.[2][6][12]

In India various methods have been used to clean the teeth. It has been common practice in India to use leaves and twigs of plants for cleaning, which is still being practiced by a sizable population.[13] Various organization have been promoting use of toothpaste and toothbrush with recommended frequency. By and large this outreach has been successful. However it has been more effective in younger population.

Periodontal disease in geriatric population is highly prevalent. The reason for this may be varied, ranging from diminished physical ability to perform the oral hygiene habits to age related changes in the periodontium which makes them susceptible for disease.[14] As there are very few studies till date assessing the role of frequency of toothbrushing on periodontal health of elderly, the present study was designed assess this association.

MATERIALS AND METHOD

This study was conducted in A.B.Shetty Memorial institution of dental sciences after obtaining clearance from ethical committee of the institution. A total of 90 subjects aged between 60-75 years reporting to the outpatient department of A.B.Shetty institute of dental sciences were enrolled in the study after obtaining a written consent.

The inclusion criteria for the study included that the subject should be aged between 60-75 years of age with a minimum of 20 teeth. Any subject with systemic diseases and conditions which can influence periodontal conditions, who have undergone periodontal therapy in previous 6 months or who are taking any medications,
mouthwashes and nutritional supplements within 3 month period were excluded from the study.

The subjects were asked about their age and toothbrushing habits. The toothbrushing frequency was categorized as follows:-

No-Does not brush at all/ uses other cleaning aids like plant twigs or fingers for cleaning the teeth (Group 1)

Once-brush once daily with toothpaste and toothbrush.(Group 2)

 Twice-Brush twice daily with toothpaste and toothbrush.(Group 3)

Periodontal pocket depth, clinical attachment level and gingival index were recorded for all the teeth excluding third molars.

Assessment of gingival inflammation

The Gingival Index (GI) as described by Loe H and Silness P in 1963 was recorded.[4]

The scoring criteria was as follows

0- Absence of inflammation/normal gingival,
1- Mild inflammation- slight change in colour, slightedema; no bleeding on Probing,
2- Moderate inflammation- moderate glazing, redness, edema and hypertrophy, bleeding on probing,
3- Severe inflammation- marked redness and hypertrophy ulceration tendency to spontaneous bleeding .

The mean of these scores indicated severity of gingival index.

Assessment of pocket depth:

The pocket depth was recorded by probing six sites per tooth (distobuccal, mid-buccal,mesiobuccal,distlingual,mid-lingual,mesiolingual),excluding third molars and tooth remnants using Williams graduated probe. The presence of pockets was scored as 0-No deepened pockets,1-atleast one site with clinical attachment loss of 1-3 mm and 2-atleast one site with clinical attachment loss of 4 mm and deeper.Of these readings, the highest score described the status of each type of tooth. The mean of these scores indicated the severity of each subject’s findings

RESULTS

Table 1: Indicators of periodontal findings according to frequency of toothbrushing

<table>
<thead>
<tr>
<th>Brushing_habit</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Total_mean_pd</td>
<td>.4291</td>
<td>.51432</td>
</tr>
<tr>
<td></td>
<td>Total_mean_cal</td>
<td>.7127</td>
<td>.23410</td>
</tr>
<tr>
<td></td>
<td>gingival_index</td>
<td>1.4182</td>
<td>.27863</td>
</tr>
<tr>
<td>Weekly</td>
<td>Total_mean_pd</td>
<td>.4245</td>
<td>.49006</td>
</tr>
<tr>
<td></td>
<td>Total_mean_cal</td>
<td>.7505</td>
<td>.17505</td>
</tr>
<tr>
<td></td>
<td>gingival_index</td>
<td>1.4545</td>
<td>.25397</td>
</tr>
<tr>
<td>daily</td>
<td>Total_mean_pd</td>
<td>.2256</td>
<td>.40694</td>
</tr>
<tr>
<td></td>
<td>Total_mean_cal</td>
<td>.5900</td>
<td>.15402</td>
</tr>
<tr>
<td></td>
<td>gingival_index</td>
<td>1.2825</td>
<td>.21224</td>
</tr>
</tbody>
</table>

Fig 1: Distribution of Mean pocket depth according to frequency of toothbrushing

Assessment of clinical attachment level:

The clinical attachment level was recorded by probing six sites per tooth (distobuccal, mid-buccal,mesiobuccal,distlingual,mid-lingual,mesiolingual),excluding third molars and tooth remnants using Williams graduated probe. The presence of clinical attachment loss was scored as 0-No Clinical attachment loss, 1-atleast one site with clinical attachment loss of 1-3 mm and 2-atleast one site with clinical attachment loss of 4 mm and deeper.Of these readings, the highest score described the status of each type of tooth. The mean of these scores indicated the severity of each subject’s findings.
DISCUSSION

The current study subjects were divided into three groups based on the frequency of brushing and were examined for periodontal pocket, clinical attachment level and gingival index.

Out of the 90 subjects, group 1 had 11 subjects (12.22%), group 2 had 22 subjects (24.5%) and group 57 subjects (63.3%). This may be due to the high level of awareness in the local region regarding the maintenance of oral hygiene. This may also be due to the fact that subjects selected were the patients visiting the dental institution for dental treatment.

The mean score of pocket probing depth in group 1 was 0.4291, in group 2 was 0.4245, and in group 3 was 0.2256.

The mean score of clinical attachment loss in group 1 was 0.7127, in group 2 was 0.7505, and in group 3 was 0.5900.

The mean score of gingival index in group 1 was 1.4182, in group 2 was 1.4545, and in group 3 was 1.2825.

This clearly shows the positive correlation between frequency of toothbrushing and gingivitis\(^{[11]}\) and periodontal pocket \(^{[1][3]}\) which is similar to the findings of few other studies. But it also shows negative correlation between increased frequency of tooth brushing i.e. (twice daily) and clinical attachment level. This might be because most of the subjects in the present study used hard bristled brush which possibly would have led to recession due to toothbrushing trauma.

The limitations of our study is that the sample size is small, and we have not taken into consideration the dexterity of the patient as it is difficult for elderly individuals, to retain the necessary dexterity to accomplish the level of dental plaque control that is required to prevent plaque accumulation\(^{[9]}\).

In the present study the information on toothbrushing behaviour was collected through self-reports. Although dental plaque indices provides better information about oral hygiene, there is evidence of good correlation between self-reported toothbrushing frequency and indices assessing\(^{[8]}\).

CONCLUSION

The findings of this study cannot be generalized as the sample selected for this study is from a very small group of population restricted to a particular geographical area. Consequently the sample in the study can give a reasonable picture of periodontal findings in geriatric population of Dakshina Kannada district. Within the limitation of the current study the it can be concluded that among the present study subjects, brushing twice daily resulted in overall better periodontal health. Awareness of toothbrushing also seems to be high in the present study group.

Source of Funding - Self

Conflict of Interest - Nil

REFERENCES


The Effect of Oxytocin Massage on Changing of Symphysis-Fundal Height (SFH) in Post Normal and Post Caesarean Birth Delivery

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1Department of Midwifery, Poltekkes Tanjungkarang, Indonesia, 2Department of Business Administration, STIAMAK Barunawati Surabaya, Indonesia

ABSTRACT

Background: Maternal Mortality Rate (MMR) in Indonesia is 81% due to complications during pregnancy and childbirth and 25% during delivery where one of the causes of bleeding is the occurrence of sub uterine involution. This can be prevented by giving oxytocin massage when providing care to normal postpartum mothers and post-cesarean section.

Methods: The population was all postpartum mothers in the midwifery room of Ahmad Yani Hospital, Metro City, Indonesia. Determination of the sample is by accidental sampling technique by including all subjects who meet the sample selection criteria until the number of research subjects is fulfilled, namely 17 exposed groups and 13 not exposed groups. The research instrument used was a questionnaire. Data were analyzed by univariate and bivariate analysis with a statistical test of Chi-square.

Results: The results showed that the proportion of normal uterine fundus in normal postpartum mothers was 64.7% and the post-cesarean section was 61.5%, whereas ordinary postpartum mothers who performed oxytocin massage were 53% and post-cesarean section mothers who completed oxytocin massage were 46.1%.

Conclusion: The oxytocin massage effect on changes in uterine fundus height in ordinary postpartum mothers with p = 0.002 with OR = 4.000 and the oxytocin massage effect on changes in uterine fundus height in post-cesarean mothers with p = 0.016 with OR = 3.500. Midwives are expected to be able to teach mothers how to measure the height of the uterine fundus in the first week using their fingers at home to ensure normal fundus uterine height before delivering babies.

Keywords - Fundal Height, Oxytocin Massage, Post-Partum, Caesar Section

INTRODUCTION

Indicators of the ability of a country’s health services according to WHO can be seen from the maternal mortality rate during the perinatal, intranasal, and postnatal periods. Specific health targets of sustainable development goals are improving maternal health and reducing to ¼ of the risk of maternal death. In Indonesia, the maternal mortality rate reaches 81% due to complications during pregnancy and childbirth and 25% during the puerperium (1).

One of the causes of postpartum hemorrhage is the occurrence of sub uterine involution - a state of permanent or involuntary retardation as the normal process causes the uterus to return to its original shape (2). Further, many in the third day postpartum mothers with Symphysis-Fundal Height (SFH) still one finger below the center, whereas it should have been three fingers below the center. This process is characterized by a slow decline in uterine fundus, a prolonged period.

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of discharge and excessive uterine bleeding with severe bleeding. The height of the uterine fundus describes the normal involution process in the middle of the symphysis center in the first week. The method of uterine involution includes the effects of oxytocin, autolysis, and tissue atrophy \(^{(3)}\).

Efforts to prevent hemorrhage post partum can be made since the third and fourth stage of labor with oxytocin. This oxytocin hormone plays a role in the process of uterine involution. The involution process will work well if uterine contractions are muscular. Efforts to control the occurrence of bleeding from the placental site by correcting the contraction and retraction of the strong myometrial fibers with oxytocin massage \(^{(4)}\).

Oxytocin can be obtained in various ways, either through oral, intra-nasal, intra-muscular or by a massage that stimulates the release of the hormone oxytocin. The effect of oxytocin massage itself can be seen after 6-12 hours of massage. Oxytocin massage is an act of spinal massage ranging from the 5-6 nerves to scapula which will accelerate the work of the parasympathetic nerve to convey commands to the back brain so that oxytocin exits \(^{(5)}\).

Based on the data obtained from the General Medical Record of the General Hospital of Jendral Ahmad Yani in Metro City, Indonesia, it was received that the incidence rate of cesarean section was 11.27% of the total deliveries. The results of the preliminary study through interviews conducted at midwives in the hospital midwifery room, they said that they had never done oxytocin massage when giving care to mothers post partum normal and post cesarean section mothers. As such this research aims at the effect of the oxytocin massage on the respective mothers.

**METHODOLOGY**

This study is a quantitative study with the total number of samples of 30 samples by using accidental sampling. This research was conducted in the Ahmad Yani Hospital Midwifery Metro City from July to October 2016. Analysis of the data in this study employed the Chi-Square test.

**RESULTS**

Based on the results of data processing, the proportion of changes in uterine fundal height is as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of birth delivery</th>
<th>Fundal Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Normal (&gt; 7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
</tr>
<tr>
<td>1.</td>
<td>Normal</td>
<td>11</td>
</tr>
<tr>
<td>2.</td>
<td>Caesar</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

Table 1 shows that post-partum mothers with standard delivery were 6 people (35.3%) with abnormal uterine fundus height, and postnatal mothers with cesarean delivery were 5 people (38.5%) with abnormal fundus uteri.

**Table 2: Oxytocin massages distribution**

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of birth delivery</th>
<th>Oxytocin Massage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Massage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
</tr>
<tr>
<td>1.</td>
<td>Normal</td>
<td>9</td>
</tr>
<tr>
<td>2.</td>
<td>Caesar</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
Table 2 indicates the normal post-partum mother’s given oxytocin massage were 9 people (53%), and the postpartum cesarean given oxytocin massage were 6 people (46.1%). Further, it was found that the mean of fundal height at the first week of post-partum mother given oxytocin massage was 7.13 cm, while the average of fundal height in postnatal mothers the first week who did not undergo oxytocin massage was 8.2 cm.

Table 3: Effect of oxytocin massage to fundal height on normal post-partum mother

<table>
<thead>
<tr>
<th>Oxytocin Massage</th>
<th>Fundal height</th>
<th>Total</th>
<th>p-value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (≤ 7)</td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>89</td>
<td>9</td>
<td>4.000</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>25</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>58.8</td>
<td>7</td>
<td>0.002</td>
</tr>
</tbody>
</table>

The statistical test obtained p-value = 0.002 meaning that oxytocin massage affects the changes in the fundal height of ordinary postpartum mothers with the oddity ratio (OR) = 4.000 indicating that the massage has the possibility of 4 times to fundal height.

Table 4: Effect of oxytocin massage to fundal height on cesarean post-partum mother

<table>
<thead>
<tr>
<th>Oxytocin Massage</th>
<th>Fundal height</th>
<th>Total</th>
<th>p-value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (≤ 7)</td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>66.6</td>
<td>2</td>
<td>3.500</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>28.6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>46</td>
<td>7</td>
<td>0.016</td>
</tr>
</tbody>
</table>

The table shows p-value = 0.016 indicating that oxytocin massage affects the changes in the fundal height of cesarean post-partum mothers with the oddity ratio (OR) = 3.500 implying that the massage has the possibility of 3.5 times to add the fundal height.

**DISCUSSIONS**

Based on an analysis of uterine fundus height changes to 30 respondents, of 17 postpartum mothers with standard and non-mass types of labor, 6 people (35.3%) had abnormal uterine fundus height, and from 13 postpartum mothers with cesarean deliveries given no massage was obtained 5 people (38.5%) with abnormal fundus uteri.

Post-partum mothers are said to have experienced a decrease in standard uterine fundus height if after birth the Symphysis-Fundal Height (SFH) is as high as the center, then after the first week, SFH is in the middle of the symphysis center and or 7 cm below the center. The abnormal decline in uterine fundus can cause sub uterine involution, infection and bleeding, therefore monitoring of the involution process must be performed by the midwife by performing height measurements of uterine fundus during the postnatal visit, so that the height of the uterine fundus is standard and abnormalities can be by post-partum mothers (6).

Based on the results of the analysis it was found that the average SFH in 15 mothers who experienced post-partum in the first week was 7.13 cm in line with previous research (7) on the effect of oxytocin massage
on uterine involution in postnatal mothers. The results of the analysis obtained OR of 3.500 meaning that post cesarean mothers who received oxytocin massage had a chance of 3.500 times getting standard uterine fundus size compared to mothers who did not get oxytocin massage. Back massage is an act of spinal massage ranging from the 5-6 to the costa until scapula will accelerate the work of the parasympathetic nerve to deliver commands to the brain back so oxytocin exits. The hormone oxytocin is used to strengthen and regulate uterine contractions, compress blood vessels and help maternal hemostasis, thereby reducing the incidence of uterine agony, especially in prolonged birth delivery (8). Besides, massage therapy has a biological effect that after 2 weeks of massage with a light touch, affects the neuroendocrine which can trigger oxytocin release and can maintain oxytocin stability (9).

The results of the research using the test of chi-square generated the p-value of 0.016, (p-value =0.002 <0.05) indicating the effect of oxytocin massage on the decrease of uterine fundus height in ordinary post-partum women. Oddity Ratio of 4.000 means that the regular postpartum mothers who received an oxytocin massage have the opportunity to get 4 times the standard uterine fundus size compared to women who did not get the oxytocin massage. This is in line with the previous research at the Central Java Regional Hospital that oxytocin massage effectively increased the incidence of uterine involution after post-cesarean section, so that a decrease in uterine fundal height could generally run (no more than 7 days) reaching 5-7 cm (10). Oxytocin plays an essential role in the female reproductive cycle. During menstruation, oxytocin is responsible for causing uterine contractions that lead to the release of the placenta and removal from the lining of the uterus. The ability to cause uterine contractions that make oxytocin a very important role during childbirth because these hormones play an essential role in triggering and regulating contractions during labor, but oxytocin release can be inhibited by, for example, acute stress, scale delivery, through mediation of adrenal catecholamine which bind to oxytocin neurons and impede ostosine release (11).

The results showed that oxytocin massage can not only be performed on ordinary postpartum women but can be done on post-cesarean women because it can accelerate the decrease in uterine fundus height. In post mother, oxytocin massage can be done and applied, in addition to facilitating the production of breast milk (the process of breastfeeding), reducing the incidence of anemia, and the mother feels quickly recovered and healthy again.

After the surgery, the wound will heal, but there are times when there are many parts of the body that are injured, and during the healing period there is undue adhesion. Sticking occurs between one wound and another that does not stick perfectly according to the location. This is what causes complaints in the form of pain around the surgical scar. The danger of being imperfectly sticky can be in the way of internal organs such as the intestine, ovary, uterus, and bladder. To get them back to their original position, we need to help by massaging.

**Ethical Clearance:** The Ministry of Health Polytechnic approved this research in Tanjung Karang, Indonesia.

**Conflict of Interest:** Nil

**Source of Funding:** The Ministry of Health Polytechnic Tanjung Karang, Indonesia.

**REFERENCES**


Study of Association between Calcium and Lipid Profile with Respect To Menopause

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ABSTRACT

Background: Menopause is the time when last and final menstruation occurs. Several studies have observed a higher incidence of CVD and osteoporosis in postmenopausal women compared with premenopausal women.

Aim and objectives: The study was aimed to estimate serum calcium, lipid profile and to find the correlation of calcium with lipid profile in healthy pre and postmenopausal women working in a tertiary care hospital.

Material and methods: An observational cross-sectional study was done on 120 subjects between the ages of 30-60 years working in a tertiary care hospital, Karad, Maharashtra from December 2016 to December 2017. They were assigned into premenopausal and postmenopausal group according to the occurrence of menopause.

Results: In our study we found that an increase in serum calcium correlates with dyslipidemia in both premenopausal and postmenopausal women, but it is statistically significant only in the later group.

Conclusion: From this study we could conclude that an increase in serum calcium has an adverse effect on the lipid profile in the postmenopausal women. So, we suggest that calcium supplementation should be prescribed vigilantly in postmenopausal women so as to decrease the cardiovascular risk which is already increased owing to the aging process in these women.

Keywords: Premenopausal women, postmenopausal women, calcium, lipid profile.

INTRODUCTION

The average life expectancy has been increased due to the improvements in medical treatment and increased focus on the preventive health care system. The average age of menopause being around 51 years, we can now expect our women to spend more than a third of their life after menopause. So, medical care specifically directed at postmenopausal women has become an important aspect of modern medicine.

Menopause means permanent stoppage of menstruation, which occurs at the end of reproductive life due to loss of ovarian follicular activity. It is the time when last and final menstruation occurs. The hormonal changes occurring during menopause, i.e., decrease in the level of estrogen and increase in the follicle stimulating hormone (FSH) exerts a major effect on the metabolism of lipids, especially lipoproteins. Estrogen has a positive effect on the lipid profile by increasing the HDL (mainly HDL 2) and decreases LDL and total cholesterol.

Calcium is the fifth most common element and also the most abundant mineral in the body. Average adult body contains approximately 1kg, or 25 mol of calcium of which 99% predominantly occurs as extracellular crystals of hydroxyapatite. The extracellular fluid, i.e., plasma and soft tissues contain rest 1% of remaining body’s calcium.

Serum calcium is a key regulator in many homeostatic systems and it has diverse functions like maintaining the bone structure, blood coagulation, and nerve muscle contraction, as a second messenger in hormone secretion and in intermediary metabolism. The key components that effectively maintain the narrow range of blood calcium are three hormones- calcitriol, parathyroid hormone (PTH) and calcitonin.
In spite of calcium supplementation being useful for bone health in children, old age and menopausal women, there is an apprehension about the possible interconnection with occurrence of cardiovascular disease.\(^7, 8\) It can be observed from several studies that there is an association between high serum calcium and cardiovascular disease, metabolic syndrome, insulin resistance and a worst lipid profile.\(^9-11\)

Though the exact cause of this change in the lipid profile is not entirely known, potential mechanism is the basic action of these cations in metabolic pathways.\(^12\)

The objective of our study was to find out the correlation between calcium and lipid profile in pre and postmenopausal women, to check if serum calcium can be considered as a good predictor of lipid abnormality with regards to menopause.

### MATERIAL AND METHOD

The current study is an observational type of cross-sectional study. It was conducted from December 2016 to December 2017. The approval letter from institutional ethics committee was obtained. All the subjects who participated in the study were selected randomly considering the inclusion and exclusion criteria, who are working in a tertiary care hospital.

**Inclusion criteria** – 120 healthy women between the age group of 30-60 years, out of this 60 were premenopausal and 60 were postmenopausal women. Women were grouped into these two groups based on the history of the menopause occurrence. Menopause has been defined as absence of menses for a consecutive period of 12 months.

**Exclusion criteria** –

Subjects who have not had natural menopause, i.e., surgical menopause or women who are on HRT.

Females taking stains, β blockers, calcium or other supplements.

Females with any obvious bone or parathyroid pathology or on chemotherapy or radiation therapy.

Before the study, written consent was obtained from all the participants.

**Collection of blood sample**

About 4ml of blood sample was collected in the morning between 7a.m. and 8a.m. after an overnight fasting by venepuncture of antecubital vein, taking all aseptic precautions in a plain vacutainer. Clear, non-haemolyzed serum was acquired by centrifuging blood at 3000rpm for 10mins.

**Estimation of serum levels of calcium and lipids**

Estimation of these parameters was done: serum calcium, total cholesterol (TC), triglycerides (TG), high density lipoprotein (HDL), low density lipoprotein (LDL) and very low density lipoprotein (VLDL).

**Methods of estimation**

Estimation of serum calcium was done by Arsenazo principle. Estimation of TC was done enzymatically by CHOD-PAP method, TG by GPO method and HDL by Trinder’s method, LDL by using Friedewald formula and of VLDL by using the formula: VLDL = TG/5

All the above investigations were performed on fully automated EM 360 Transasia autoanalyser by using the same kit. The assays were done on the same day of the collection within 3 hrs.

**Statistical analysis**

All the results of the above mentioned parameters were initially entered in an excel sheet in a tabular form and the analysis was done with the help of SPSS software version 20, by using unpaired t-test and Pearson correlation.

**RESULTS**

The study was carried out on 60 premenopausal and 60 postmenopausal women and showed following results: - General examination and systemic examination of all the subjects was normal. Premenopausal women were between the age group 30-50 years with mean age of 39.2 years, while postmenopausal women were between the age group 43-60 years with mean age of 51.63 years.

For comparison of serum calcium in premenopausal and postmenopausal women, unpaired t-test was used, with t-value 3.622 and p-value 0.0004. Difference between the serum calcium levels of premenopausal and postmenopausal women was statistically significant. [refer Table 1]

Table 2 shows the mean and standard deviation of
lipid profile in both premenopausal and postmenopausal women. It shows that TC and TG are high in postmenopausal women while HDL is high in premenopausal women.

The correlation table shows that, in premenopausal women all values of chi-square are positively skewed meaning that serum calcium is directly proportional to the lipid profile. But it is not statistically significant. While, in post-menopausal group we have statistically significant positive correlational values except HDL which is inversely proportional. [refer Table 3]

Table 1: Comparison of serum calcium among premenopausal and postmenopausal women.

<table>
<thead>
<tr>
<th>Serum calcium</th>
<th>Premenopausal group N=60</th>
<th>Postmenopausal group N=60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.405</td>
<td>8.933</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.7723</td>
<td>0.6490</td>
</tr>
<tr>
<td>Un-paired t-test</td>
<td>3.622</td>
<td>0.6490</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0004*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant when p<0.05

Table 2: Distribution of lipid profile among premenopausal and postmenopausal women.

<table>
<thead>
<tr>
<th>Lipid profile</th>
<th>Premenopausal group</th>
<th>Postmenopausal group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>TC</td>
<td>172.23</td>
<td>27.36</td>
</tr>
<tr>
<td>Log_{10} TG</td>
<td>1.97</td>
<td>0.15</td>
</tr>
<tr>
<td>HDL</td>
<td>53.27</td>
<td>8.90</td>
</tr>
<tr>
<td>VLDL</td>
<td>20.05</td>
<td>7.14</td>
</tr>
<tr>
<td>LDL</td>
<td>98.92</td>
<td>22.45</td>
</tr>
<tr>
<td>LDL/HDL</td>
<td>1.91</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Table 3: Correlation between serum calcium and lipid profile among premenopausal and postmenopausal women.

<table>
<thead>
<tr>
<th>Characteristics of lipid profile</th>
<th>Serum Calcium</th>
<th></th>
<th>Postmenopausal group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Premenopausal group</td>
<td>Sig. (2-tailed)</td>
<td>Postmenopausal group</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Pearson Correlation®</td>
<td></td>
<td>Pearson Correlation®</td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>0.021</td>
<td>0.876</td>
<td>0.651</td>
<td>&lt; 0.0001**</td>
</tr>
<tr>
<td>Log_{10} TG</td>
<td>0.133</td>
<td>0.312</td>
<td>0.276</td>
<td>0.033**</td>
</tr>
<tr>
<td>HDL</td>
<td>0.069</td>
<td>0.598</td>
<td>-0.235*</td>
<td>0.070</td>
</tr>
<tr>
<td>VLDL</td>
<td>0.129</td>
<td>0.326</td>
<td>0.295</td>
<td>0.022**</td>
</tr>
<tr>
<td>LDL</td>
<td>0.043*</td>
<td>0.742</td>
<td>0.562</td>
<td>&lt; 0.0001**</td>
</tr>
<tr>
<td>LDL/HDL</td>
<td>0.010*</td>
<td>0.940</td>
<td>0.178</td>
<td>0.174</td>
</tr>
</tbody>
</table>

**Significant when P<0.05  *represents negative correlation
DISCUSSION

Among postmenopausal women, coronary artery disease (CAD) is one of the leading cause of death. In fact, there is four to eight times more risk of death due to CAD than any other disease in these women. Increased cholesterol is a crucial factor in the pathogenesis of atherosclerotic disease. In our study the mean age in premenopausal women is 39.2 years, while that of postmenopausal women is 51.63 years. The mean age in postmenopausal group is greater than that of premenopausal women. It is difficult to avoid this difference in the age group as it is not possible to design a study that can eliminate the effects of normal aging process from that of natural menopause.

In our study, we observed an increase in levels of TC, TG and LDL. These changes in lipid profile can be attributed to the decreased level of estrogen in postmenopausal women. Also we observed a decrease in HDL in postmenopausal women when compared to premenopausal women, suggesting the protective role of estrogen in premenopausal women. Similar results are observed in several studies.

Estrogen increases HDL by various mechanisms, which mainly includes hepatic production of apolipoprotein A and decreased hepatic elimination of HDL2 by reducing the activity of hepatic lipase. As the estrogen level is low in the postmenopausal period, all these actions of estrogen are hindered resulting in increase in TC and LDL level and decreased HDL.

The main finding in our study was a direct association between calcium and TC, TG and LDL in the entire study population. No significant association was found between calcium and lipid profile in the premenopausal women. In postmenopausal women, with increase in serum calcium, significant increase in TC, TG and LDL was observed. But, a significant inverse relationship between calcium and HDL was seen.

On the basis of these results we can conclude that there is a significant and direct relationship between serum calcium and lipid. It also suggests that, estrogens might be playing a crucial role in counteracting the undesirable effect of serum calcium on lipid profile in the premenopausal women.

Various mechanisms are involved in the relationship between calcium, lipids and estrogen. Some researchers have documented that calcium supplementation might be increasing the endogenous serum triglyceride by decreasing the hepatic catabolism of cholesterol in estrogen deficient states during normal states; estrogen is found to increase cholesterol catabolism in liver by activating the LDL receptor. Contrary to that, calcium is found to decrease cholesterol catabolism leading to an increase in lipid synthesis. This action of calcium can be explained by decrease in the activity of 7α-hydroxylase, an enzyme involved in cholesterol catabolism and stimulation of Sterol Regulatory Element Binding Protein (SREBP)-1c expression which is a transcription factor in de-novo synthesis of lipids.

Decrease in the amount of physical activity also plays an important role in the alteration of lipid profile in the postmenopausal women. During exercise TG stored in adipose tissue is hydrolyzed to free fatty acids which are the main source of energy. Exercise also increases lipoprotein lipase activity in the lining of capillary endothelium. Thus, it decreases the levels of TC, TG and VLDL while reduced physical activity in postmenopause increases this levels.

Based on these evidences, we observed that the combination of lack of estrogen and physical exercise and comparative higher calcium levels might be adversely affecting the lipid profile and as a consequence individual cardiovascular risk. Our results suggest that, postmenopausal women have unfavorable lipid profile in terms of increased TC, TG, LDL and decrease in HDL levels.

CONCLUSION

The results of our study show a significant correlation between serum calcium and TC, TG, LDL & HDL in the postmenopausal women. These findings indicate that, calcium supplementation should be done with great care, at least in the postmenopausal women by closely monitoring the lipid profile.

Limitation

Small sample size is a limitation of our study. Also, along with lipid profile, estimation of apolipoproteins could have given a better idea about the effect of menopause. Also, being an observational study, causal association cannot be explained emphatically.
Acknowledgement: We are grateful to KIMSDU, Karad, Maharashtra, for funding this research project

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

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Development of Empowerment Model of People with Mental Health Disorders in Community and Prison, to Improve Productivity and Quality of Life, in Indonesia

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ABSTRACT

Introduction: Empowerment is a key component of restoration and need to be assessed in remedies in addition to more conventional outcome measures of symptoms and functioning, empowerment might be a treatment aim in schizophrenia and impartial residing abilities as well as perceived social aid may be the mediating elements.

Material/Method: Literature review through brief review models.

Finding: Many variables influencing quality of life (QOL) for outpatients with schizophrenia were identified from prior research. Symptom severity, psycho- social rehabilitation activities, and empowerment have all been absolutely recognized as key variables

Discuss: Each incorporating empowerment and advocacy primarily based interventions into recuperation oriented services and presenting community-based, individual-targeted services to people based on individually defined desires are essential guidelines for future recuperation-oriented efforts

Conclusion: The problem of care or care giver of people with mental disorder in Indonesia is still very complex, there are some things expressed by the ministry of health republic Indonesia, the problem of resources in the maintenance, the distribution of human resources still accumulate in large cities, health facilities to treat patients with mental disorders are still very low, stigma and discrimination from family and society, and the percentage of financing of patient care with low mental disorder

Keyword: Empowerment model, schizophrenia, prison, problem on mental health in community

INTRODUCTION

Empowerment is a key component of restoration and need to be assessed in remedies in addition to more conventional outcome measures of symptoms and functioning (1), empowerment might be a treatment aim in schizophrenia and impartial residing abilities as well as perceived social aid may be the mediating elements (2). Epidemiological research performed with prisoners in numerous international locations have proven a high occurrence of psychiatric morbidity (3). People with a records of mental disease revel in mainly poor results following launch from prison that are not absolutely explained by pre-existing downside, evidence-based transitional empowerment for prisoners with a records of mental health problem should be supplied at a stage commensurate with need (4). In an influential record in England and Wales, the workplace of countrywide facts was observed that 7–14% of prisoners had a practical psychotic ailment, 50–78% had character sickness and 40–seventy six% suffered from depression, obsessive-compulsive disorder or an anxiety-related disorder (5).
Mental health problems arise at high fees in all countries of the sector (6). An expected 450 million human beings globally are afflicted by mental or behavioral problems (7). These problems are specially regularly occurring in prison populations. The disproportionately high charge of mental problems in prisons is related to several factors: the considerable misconception that anyone with mental problems are a threat to the general public; the general intolerance of many societies to difficult or disturbing behavior; the failure to promote treatment, care and rehabilitation, and, certainly, the lack of, or negative get entry to, intellectual fitness offerings in many nations. Many of those problems can be present before admission to prison, and can be in addition exacerbated by the strain of imprisonment. But, mental disorders may additionally expand throughout imprisonment itself as a consequence of winning conditions and additionally possibly due to torture or different human rights violations (8).

Four out of each ten people stricken by mental issues which include schizophrenia, depression, intellectual disability, alcohol use disorders, epilepsy, and those committing suicide are living in low- and middle-income nations, mental and substance abuse problems are critical causes of ailment burden, accounting for 8.8% and 16.6% of the full burden of disorder in low-income and middle-income countries, respectively (6).

Humans with mental problems, such as schizophrenia, bipolar disease and despair are some distance more likely than the overall populace to die due to their untreated mental or bodily health issues, reviews from a number international locations suggest that incarcerated individuals are much more likely to be suffering from mental illness and substance abuse disorders than people outside of prisons and jails (4).

DISCUSSION

Many variables influencing quality of life (QOL) for outpatients with schizophrenia were identified from prior research. Symptom severity, psycho-social rehabilitation activities, and empowerment have all been absolutely recognized as key variables (9). Following a recuperation technique in mental health services by focusing on the improvement of the social community, stigma discount and particularly on the development of private power has the potential to lessen depression in patients with psychosis and enhancing their QOL (10).

It is essential that provider vendors and directors make extra efforts to eliminate or reduce self-stigma and unmet restoration wishes, that are associated with the betterment of the general high-quality of life and lengthy-time period restoration (11). Each incorporating empowerment and advocacy primarily based interventions into recuperation oriented services and presenting community-based, individual-targeted services to people based on individually defined desires are essential guidelines for future recuperation-oriented efforts (12).

Divert human beings with intellectual issues closer to the mental health system: Prisons are the incorrect place for lots people in need of mental health treatment, because the crook justice gadget emphasizes deterrence and punishment in preference to treatment and care (13) (7). Regulation provide prisoners with access to appropriate mental health treatment and care: access to assessment, treatment, and (while important) referral of humans with mental problems, along with substance abuse, have to be an quintessential a part of fashionable health offerings to be had to all prisoners (14). Offer get right of entry to acute mental health care in psychiatric wards of general hospitals: when prisoners require acute care they ought to be temporarily transferred to psychiatric wards of fashionable hospitals with appropriate safety tiers (15) (7). Encourage inter-sectoral collaboration: Many problems and troubles can be solved with the aid of bringing relevant Ministries and different actors collectively to discuss the wishes of prisoners with mental health issues (5).

CONCLUSION

Mental health problem in Indonesia are very complex that WHO data shows an estimated 24 million people living with schizophrenia (16), data from the Ministry of Health Indonesia approximately 1 million (1.7 people per mil) diagnosed with schizophrenia (17), where health facilities and care of people with mental disorders in Indonesia according to the health department of Indonesia republic survey still not meet the good ratio between patients and facilities throughout the region in Indonesia (18).

The problem of care or care giver of people with mental disorder in Indonesia is still very complex, there are some things expressed by the ministry of
health republic Indonesia, the problem of resources in the maintenance, the distribution of human resources still accumulate in large cities, health facilities to treat patients with mental disorders are still very low, stigma and discrimination from family and society, and the percentage of financing of patient care with low mental disorder(17), and uneven distribution of psychologists, nurses, doctors, care giver at mental health centers and health center in the prisons throughout Indonesia(16).

Conflict of Interest : Nil

Source of Funding : Self funding

Ethical Clearance: None

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Management of an Unusual Midline Diastema with a Fixed Appliance: A Case Report

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ABSTRACT

This is the case of a 12 year old, male child who reported with a 9mm midline diastema due to two mesiodens. The diastema was unusual as the central incisors were displaced unequally from the midline. Tooth 21 and 22 were displaced more distally from the midline leaving inadequate space for eruption of tooth 23. The challenge in this case was to close this unequal diastema. Thus the conventional fixed appliance which relies on reciprocal anchorage could not be used to close the diastema. Hence the fixed appliance was modified by using a Nance palatal arch with a labial wire extension to close this unequal diastema. The presentation discusses this unusual presentation of diastema and the modified fixed appliance used to treat the case.

Clinical Relevance: This case report explains the biomechanics during midline diastema closure where the space is unequally distributed across the midline.

Keywords: Diastema, Mesiodens, Incisors

INTRODUCTION

The maxillary midline diastema, because of its esthetic importance causes a lot of concern among the parents and the child\textsuperscript{1}. The etiology could be both environmental and genetic\textsuperscript{2}. According to Moyer’s\textsuperscript{3}, the causes of a maxillary midline diastema could be many. Imperfect fusion of the premaxilla at the midline, enlarged upper labial frenum, the diastema being part of the normal growth, congenitally missing lateral incisors, midline supernumerary teeth, small size of teeth relative to the jaw size are the common causes enlisted. The treatment plan for a maxillary midline diastema must take into consideration the causative factors of the diastema and the retention plan to prevent relapse.

Maxillary midline diastemas exceeding 2mm are unlikely to close spontaneously following eruption of canines and are indicated for early closure\textsuperscript{4}. This is especially true in cases of large unaesthetic diastemas or where the position of the central incisors will inhibit the normal eruption of the lateral incisors or canines\textsuperscript{5}. In large diastemas, it is important to close the diastemas with bodily orthodontic movements rather than tipping movements. Tipping movements also tend to result in more relapse\textsuperscript{6}.

This is a case report of the management of large, midline diastema caused by the unequal displacement of the central incisors. The biomechanics involved in the orthodontic closure of this unusual diastema is explained in this case report.

CASE REPORT

A 12 year old was brought by his parents to our clinic with a chief complaint of a large unaesthetic space in the upper front region. The child was concerned regarding the unaesthetic appearance in the upper front region. The medical history was insignificant. Intraoral examination revealed a class 1 malocclusion. 2 midline
supernumerary teeth (Mesiodens) were causing the diastema. The diastema was approximately 9 mm. Tooth 11 was displaced labially with a 4 mm overjet, but was closer to the midline compared to 21 which was displaced distally 7 mm approximately by the 2 mesiodens causing the unequal diastema. (Figure 1: A, B, C). The other teeth present in the upper arch were 16, 15, 14, 53, 12, 22, 24, 25, 26. There was no space present in the arch for the eruption of tooth 23. OPG revealed the presence of unerupted permanent canines (Figure 2). There were no other supernumerary teeth or any other abnormality seen on the OPG. No abnormality was detected with the maxillary frenal attachment.

Figure 1: Pre-operative photograph

![Figure 1: Pre-operative photograph](image)

In the 2nd stage after a month, the diastema closure was initiated. The arch wire used was 020 inch round stainless steel. Teeth 16 to 11 were consolidated into a single segment with a figure of 8 ligature wire. Similarly, teeth 24 to 26 were consolidated as a single segment. A Nance palatal arch with a labial projection with a hook extending to the midline of the arch was fabricated to pull the teeth 21 and 22 towards the midline. The teeth 21 and 22 were engaged with an e chain to the hook on the wire extension and consolidated separately as a single segment to mesialise the two teeth. (Figure 4A, B)

Figure 2: Orthopantamograph

![Figure 2: Orthopantamograph](image)

The two supernumerary teeth were extracted under local anesthesia. Tooth 53 exfoliated normally. The first molars were banded and other erupted teeth were bonded as part of the sectional fixed appliance. In the first stage, initial levelling and alignment was done with 014 inch round NiTi for a month to reduce the proclination of 11. (Figure 3).

Figure 3: Initial alignment

![Figure 3: Initial alignment](image)

Over a period of 2 months, the teeth 21 and 22 were mesialised 5 mm gradually towards the wire extension. At this stage about 4 mm of diastema remained with 2 mm distributed on either side. At this stage, the Nance palatal arch with extension was removed. The 4 incisors were engaged with the elastic chain to close the diastema using reciprocal anchorage. (Figure 5) The diastema closure was achieved over a period of 6 months. The case is under follow up to derotate tooth 24 to create space for the unerupted 23. (Figure 6 A, B)
DISCUSSION

Midline diastema as described by Angle, is a common form of incomplete occlusion characterized by a space between the maxillary and, less frequently, mandibular central incisors. A midline diastema is commonly seen in the mixed dentition. It could be part of the normal growth as in an ugly duckling stage or it could be due to other factors such as supernumerary teeth causing displacement and requiring early intervention. The presence of supernumerary teeth (Mesiodens) cause a variety of pathological disturbances the most common of which is a diastema. According to Kokich et al., diastema was perceived as unattractive by laypeople when the distance between the central incisors was more than 2mm. The cause for diastema in the present case was due to the presence of two mesiodens. The treatment of large diastematas are very often for esthetic and psychological than for functional reasons. In addition to the esthetic concerns, this case required early intervention to prevent potential traumatic injury to tooth 11 which was labially placed. Also there was inadequate space for the eruption of tooth 23.

According to Russel and Folwarzna, mesiodens should be extracted in the early mixed dentition period which will enhance better alignment of teeth thus minimizing the need for orthodontic treatment. Mitchell and Bennett have suggested that in cases of completed root formation in adjacent permanent incisors, mesiodens extraction can be carried out later and in permanent dentition period, line of treatment is extraction of mesiodens followed by fixed orthodontic appliances for diastema closure.

Some of the common methods used to treat midline diastemas are using removable and fixed appliances, elastics, composite build ups etc. Removable appliances cause only tipping movements and hence not indicated here. Elastics have the potential to slip subgingival and can damage the periodontium. Composites can be used to close small diastemas but not in cases of large diastemas. Large diastemas described in this case report require fixed appliances to cause controlled bodily
movement.

The challenge in this case was to close the diastema by initially moving only the teeth 21 and 22 without moving tooth 11. Thus a conventional fixed appliance which would make use of reciprocal anchorage to close the diastema could not be used. A modified appliance combining fixed appliance therapy with a Nance palatal arch was designed to fulfill the objectives of the treatment.

According to Sullivan et al\textsuperscript{13}, relapse occurs in almost 34\% of the cases and thus retention with a bonded palatal retainer is indicated long term or even for life. The present case is under follow up in order to obtain an ideal outcome that is to create space for the eruption of 23 thereby converting it into a non-extraction case.

**CONCLUSION**

Midline diastema is a common occurrence in the mixed dentition. Though many modes of treatment for midline diastema are available, the treatment plan must be individualized and the appliance must be modified depending on the presenting clinical situation.

**Conflict of Interest:** Authors have no conflict of interest.

**Source of Funding:** Self-funded.

**Ethical Clearance:** The present case report has been approved by institutional ethics committee.

**REFERENCES**

Comparative Study on Overweight and Obesity among School Going Adolescent boys in Small Town and Metropolitan City of West Bengal

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ABSTRACT

Background- Childhood and adolescent obesity is one of the most serious public health challenges of the 21st century. The problem is global and is affecting many low and middle-income countries, particularly in urban settings. The most importance significance is persistence of obesity into adulthood with all the associated health risks.

Materials and Method: It is the observational, cross-sectional and comparative study and a total of 1200 boy students, 600 from one government and one private school of metropolitan city of Kolkata and 600 from a government and a private school of rural town of Midnapore district of West-Bengal were enrolled. In our study BMI was calculated from weight and height, and cut off of 23 and 27 were taken for overweight and obesity respectively. It is observed that 16.3% and 4% boys from Midnapore town were overweight and obese respectively. In Kolkata city 18.3% and 6% boys were overweight and obese respectively. Statistically significant (P<.0001) difference is found in the BMI of boys from Midnapore town and Kolkata city.

Conclusion: It is seen that children from cities and those belonging to higher socio-economic groups with less outdoor activities and consuming fast food were more likely to be overweight and obese than the boys from small town areas. These factors should be addressed and necessary measures should be taken to reduce the incidence of obesity especially in urban setting.

Keywords- Overweight, obesity, BMI, adolescent boys, Metopolitan, Town

INTRODUCTION

The World Health Organization has described obesity as one of the most neglected public health problems. Along with increase in adult obesity, the proportions of children and adolescents who are overweight and obese have also been increasing. The basic reasons behind the rising trend in obesity is due to shift in the diet towards increase intake of energy-dense food that are high in fats and carbohydrates but low in minerals, vitamins and other healthy micronutrients. The increasing trend towards decreased levels of physical activity adds to the increasing problem. The impact of such risk factors are moderated by factors such as age and gender. Family characteristics, parenting style and parent’s lifestyles also plays a major role. Environmental factors such as school policies, demographics, and parent’s work related demands further influence eating and activity behaviours. Genetics are one of the biggest factors as the cause of obesity. In our study we wanted to compare the prevalence of over-weight and obesity among the metropolitan city and small town settings.

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MATERIALS AND METHOD

This present study is observational, cross-sectional, questionnaire-based study done between February 2018 to July 2018. One private and one government boy’s school of Kolkata Metropolitan city comprising of 600 students and a private and a government boy’s school of small town of Midnapore district comprising of 600 students participated in our study. These children were between age 10 to 16, from class 5th to 11th standard. The children were selected by systemic random sampling. Prior intimation and consent was taken from the school authorities and consent was taken from all the students under study. There is no conflict of interest in our study. A standardized questionnaire was provided to all eligible candidates and each candidate was explained every question in detail. Height was measured (to the nearest 0.1 cm) with the subject standing in an erect position against the vertical scale with head, shoulders, buttocks and heels touching the flat surface (wall) as per CDC guidelines. Body weight was measured (to the nearest 0.1 kg) with the subject standing motionless on the weigh machine with feet 15 cm apart and weigh distributed equally on both legs.

Body mass index (BMI) was calculated as weight in kg/height in metre². Overweight and obesity was calculated by BMI for age. To define overweight and obesity in children, adult equivalent of 23 and 27 cut-offs presented in BMI chart was used. Overweight is also defined as a BMI above the 85th percentile and below 95th percentile for children and teens of same sex and age. Obesity is defined as BMI at or above the 95th percentile for children and teens of the same sex and age.

RESULTS

TABLE 1: Prevalence of overweight and obesity in different age groups in Midnapore Town

<table>
<thead>
<tr>
<th>Age group</th>
<th>No of Students</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11</td>
<td>89</td>
<td>12(14%)</td>
<td>2(2.4%)</td>
</tr>
<tr>
<td>11-12</td>
<td>106</td>
<td>16(15.4%)</td>
<td>5(4.5%)</td>
</tr>
<tr>
<td>12-13</td>
<td>94</td>
<td>14(15%)</td>
<td>3(3.5%)</td>
</tr>
<tr>
<td>13-14</td>
<td>112</td>
<td>17(15.6%)</td>
<td>5(4.8%)</td>
</tr>
<tr>
<td>14-15</td>
<td>98</td>
<td>18(18.4%)</td>
<td>4(4.4%)</td>
</tr>
<tr>
<td>15-16</td>
<td>101</td>
<td>21(20.6%)</td>
<td>5(5.2%)</td>
</tr>
</tbody>
</table>

TABLE 2: Prevalence of overweight and obesity in different age groups in Kolkata City

<table>
<thead>
<tr>
<th>Age group</th>
<th>No of Students</th>
<th>Overweight</th>
<th>Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11</td>
<td>80</td>
<td>13(16.2%)</td>
<td>3 (3.7%)</td>
</tr>
<tr>
<td>11-12</td>
<td>102</td>
<td>17 (16.6%)</td>
<td>6 (5.8%)</td>
</tr>
<tr>
<td>12-13</td>
<td>104</td>
<td>18 (17.4%)</td>
<td>7 (6.7%)</td>
</tr>
<tr>
<td>13-14</td>
<td>96</td>
<td>18 (18.4%)</td>
<td>5 (5.2%)</td>
</tr>
<tr>
<td>14-15</td>
<td>112</td>
<td>21 (19.2%)</td>
<td>7 (6.2%)</td>
</tr>
<tr>
<td>15-16</td>
<td>110</td>
<td>23 (21.2%)</td>
<td>8 (7.2%)</td>
</tr>
</tbody>
</table>

TABLE 3: Comparison of overweight and obesity between Midnapore Town and Kolkata City

<table>
<thead>
<tr>
<th></th>
<th>OVERWEIGHT</th>
<th>OBESITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Midnapore Town</td>
<td>16.3</td>
<td>2.86</td>
</tr>
<tr>
<td>Kolkata city</td>
<td>18.3</td>
<td>3.14</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

In the present study overweight and obesity in Midnapore town was found to be 16.3% and 4% respectively whereas in Kolkata metropolitan city overweight was 18.3% and obesity was 6% respectively. We have found significant difference (P value <.0001) for both overweight and obesity while comparing both group from small town and Kolkata city. To determine the factors responsible for this statistically significance of the higher prevalence of overweight and obesity children in the Kolkata city group, analysis of distribution of the socio-economic factors, levels of physical activities and eating habits of children were assessed. These two groups showed statistic significance in terms of family income, visit to restaurants, intake of junk food, physical training carried out in schools and the means of transport to and fro from the school. The city children used vehicles like pool cars, bus for mode of travel whereas the town students mainly walked to school and used bicycle.
DISCUSSION

Bharati et al.\(^1\) reported prevalence of overweight and obesity to be 3.1\% and 1.2\% respectively, Sethi and Kapoor reported prevalence of overweight and obesity to be 13.4\% and 7.8\% respectively from Delhi. Deshmukh et al. reported overweight/obesity to be 2.2\% in rural areas of Wardha district. Reviewing the previous studies conducted in small town like Bankura in West Bengal district (Gupta et al 1984) was 7.7\% overweight and 4.4\% obese. Harish Ranjani et al.\(^2\) in 2010 combined 19.3\% of childhood overweight and obesity which was a significant increase from the earlier prevalence of 16.3\% in 2001 and 2005. Study conducted by Jain S, Pant B, Chopra H, Tiwari R\(^3\), it was seen 18.4\% overweight and 10.2\% obese respectively among adolescents of affluent public schools in Meerut. Bulbul & Hoque\(^4\) performed a similar study on childhood obesity in Bangladesh in 2009 where they included children between age 6-15 years in both rural and urban areas. They found that both in urban and rural areas 3.5\% were obese, 9.5\% were overweight. Zhang YX, et al.\(^5\) observed remarkable increase in overweight and obesity in urban adolescent from 1985 to 2010. Ramachandran A et al.\(^6\) highlighted high prevalence of overweight (17.8\%) in adolescent boys in urban India. Genetic predisposition to obesity is well established (Lyon & Hirschhorn,2005) and genes that influence obesity is like to be associated with BMI (Haworth et al,2008).

Pathak S et al.\(^8\) found obesity and overweight was highly prevalent in urban adolescents than rural adolescent males. Arnab Ghosh\(^9\) observed that prevalence of overweight and obesity among adolescent is not restricted to any particular habitat and early intervention is required to check this global epidemic. The study conducted by Goyal RK et al\(^9\) and Kotian et al also indicated higher prevalence of overweight and obesity of children of higher and middle socio-economic income groups.

There were some limitations of our study as the lifestyle of most students were recorded, based on the recall of their activities which might not be that accurate. This study did not involve the family for the nutritional assessment and and furthermore these type of studies should involve more participants from more schools.

CONCLUSION

The study showed that:

- There has been an overall rise in case of overweight and obesity in young adolescent boys and in younger generations irrespective of type of urban and semi-urban areas.
- There is significant increase in overweight and obesity in adolescent boys in metropolitan city than in small town.
- The higher standard students showed more incidence of increase in overweight students in both in Midnapore and Kolkata showing dangerous trend of non-healthy population growth in future.
- There is emergent need for national health measure to put a stop in this preventable public health disease by starting national health and nutritional evaluation programmes, yoga and out-door activities in school curriculum.

Ethical Clearance- Taken from Ethical committee of our Institution (CSS College of Obs,Gyne and Child Health)

Source of Funding- Self

Conflict of Interest- Nil

REFERENCES


Effects of Mode of Delivery on Cord Blood Thyroid Stimulating Hormone

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ABSTRACT

Background: Congenital hypothyroidism (CH) is a very common congenital endocrine disorder. In most cases, CH is permanent and results from an abnormality in thyroid gland development (dysgenesis or agenesis) or a defect in thyroid hormone synthesis. Thyroid function is dynamic during the prenatal period with many factors like gestational age, mode of delivery, birth weight and the day of sample collection.

Aim & objective: To find out mode of delivery on TSH cord blood.

Materials and Method: A cross-sectional study of neonates born in KIMS Hospital Karad from December 2013 to February 2015 was done. Blood samples were collected from the cord at birth and 24 hours sample collected from peripheral veins while observing all safety and aseptic precautions.

Statistical Analysis: Student t test (two tailed, independent) was used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters.

Results: The mean value of TSH (miu/dl) in the neonates was 2.77±0.46 (mean±SD).

Conclusion: Mode of delivery need not be taken into account when TSH values, in samples collected at birth in term neonates.

Keywords: Thyroid Stimulating Hormone, Mode of Delivery.

INTRODUCTION

Thyroid hormone (TH) concentration is low in the fetus during the first half of pregnancy. During this time, the fetus is entirely depending on maternal TH. The fetal hypothalamic-pituitary-thyroid axis begins to function by mid-gestation and is mature in the term infant at delivery. The critical role of thyroid hormones in CNS maturation has long been recognized. Thyroid hormones primarily affect neuronal differentiation and synaptogenesis. Thyroid function is dynamic during the prenatal period with many factors potentially influencing neonatal TSH and thyroid hormone levels. Various factors like gestational age, mode of delivery, birth weight and the day of sample collection may influence measured TSH levels in a screening programs. The effect of these factors is not clearly defined as some studies state that neonates delivered by Caesarean section are significantly more likely to have TSH levels higher than those born by vaginal delivery, while others have reported higher blood TSH concentration in neonates born vaginally. Nevertheless some studies which document that neonatal thyroid function is unaffected by mode of delivery.

MATERIALS AND METHOD

Study Design: A cross-sectional study of neonates born in KIMS Hospital Karad from Dec 2013 to February 2015 was done. Blood samples were collected from the cord at birth and 24 hours sample collected from peripheral veins while observing all safety and aseptic precautions. Blood samples were analyzed...
for TSH by using Lumax machine, based on Chemi-
Luminescence Immuno-Assay (CLIA) technique. A
total of 462 samples were collected included in the
study. Descriptive statistics with respect to TSH values
and age, birth weight, mode of delivery were studied.
Neonates were divided into groups on the basis of their
birth weight and mode of delivery. The relationship of
TSH with mode of delivery was evaluated statistically.

Statistical Methods & Analysis:

Descriptive statistical analysis was carried out in
this study. Results on continuous measurements are
presented as Mean ± SD (Min- Max) and results on
categorical measurements are presented in Number (%).
Significance was assessed at 5 % level of significance.
Student t test (two tailed, independent) was used to
find the significance of study parameters on continuous
scale between two groups (Inter group analysis) on
metric parameters. SPSS (Statistical Packages for Social
Sciences) 20.0 software was used for the data and Ms-
Excel have been used to generate graphs, tables etc.

RESULTS

In this study 462 neonates were included based
on inclusion and exclusion criteria. Samples for TSH
were collected at birth. Of all the babies, 234 were born
through full term normal vaginal delivery while 228
were born through caesarean section. (Table 1).TSH in
the samples was measured using CLIA. The mean value
of TSH (miu/dl) in the neonates was 2.77 ±0.46 (mean ±
S.D) ( refer Table 1)

Table 1: Showing the Mode of Delivery and
Levels of TSH.

<table>
<thead>
<tr>
<th>Mode of Delivery</th>
<th>TSH (in µIU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTND</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>234</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.40</td>
</tr>
<tr>
<td>Maximum</td>
<td>19.50</td>
</tr>
<tr>
<td>Mean</td>
<td>5.7428</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2.64686</td>
</tr>
<tr>
<td>LSCS</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>228</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.50</td>
</tr>
<tr>
<td>Maximum</td>
<td>17.20</td>
</tr>
<tr>
<td>Mean</td>
<td>5.3636</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.96524</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td></td>
</tr>
<tr>
<td>Unpaired ‘t’ test value</td>
<td>1.745</td>
</tr>
<tr>
<td>p value</td>
<td>0.082</td>
</tr>
</tbody>
</table>

DISCUSSION

In our study the mean TSH value (µIU/ml) in
neonates born by full term normal delivery (FTND)
was 5.74 ± 2.64 (mean ± S.D) and mean TSH value
(µIU/ml) in neonates born by caesarean section (LSCS)
was 5.36 ±1.96 (mean ± S.D) with a p value of 0.082
(Table 1) which is not statistically significant indicating
that neonatal TSH values collected from the cord at
birth are not influenced by mode of delivery. This is
in close agreement with results of the study done by R
C Franklin et al in which T4,T3, FT$ RT3,TBG and
TSH concentrations were measured in 229 healthy term
neonates at birth and at 5, 10,and 15 days of age using radio
immunoassay. They found that mode of delivery had no
effect on mean values of TSH and hence concluded that
mode of delivery need not be taken into account when
determination of TSH is used for screening congenital
hypothyroidism in health when determination of TSH is
used for screening congenital hypothyroidism in healthy
term neonates.7 Similar findings were found by Fuse Y
et al in a study to evaluate the effect of perinatal factors
on TSH and thyroid hormone levels in cord blood. They
found that there was no significant difference in the mean
TSH levels among neonates born by caesarean section
and those born by normal vaginal delivery.6 However
cohort study done by Aidan McElduff et al had different
findings. They measured whole blood TSH levels in blood
collected by heel-prick method 48 hours after birth by
dissociation – enhanced fluoroimmunoassay performed
on an auto DELFIA analyzer as part of newborn
screening program. They found high TSH levels in
neonates born by cesarean section. To explain this effect
the authors proposed that topical iodine skin preparation
for cesarean section may deliver an iodine load to the mother, part of which can be transferred to the infant resulting in acute inhibition of thyroid function (Wolff-Chaikoff effect). On the other hand in two different studies done by Lao TT and Miyamato N they found the results otherwise. Lao TT et al performed a study to assess the association between the mode of delivery with the umbilical cord plasma T4 and TSH concentration in full-term uncomplicated pregnancies. Umbilical cord plasma T4 and TSH concentrations were measured using radioimmunoassay. They found that babies born vaginally had statistically significantly higher umbilical cord plasma TSH than babies born by caesarean section. The authors concluded that the mode of delivery should be taken into consideration in the interpretation of umbilical cord plasma TSH results. Miyamato N et al measured the cord serum levels of TSH, T4 and T3 in 922 neonates delivered by mothers who had no thyroid disorders. The mean cord serum TSH level following elective Caesarean section was 6.5 ± 3.1, which was significantly lower than after normal vaginal delivery ie. 9.5 ± 6.0 (p < 0.005). But there was no correlation between the cord serum TSH level and the CH screening TSH levels in neonates born by vaginal delivery reflects delivery stress and mode of delivery does not influence the TSH values in CH screening in which blood is obtained at five day of life. In our study we measured TSH from neonatal samples collected from the cord at birth and have found that mode of delivery does not affect neonatal TSH values.

**CONCLUSION**

This study was undertaken to evaluate the effect of mode of delivery on TSH at birth. No significant difference was found based on mean TSH values in groups of term neonates divided based on mode delivery. Hence it can be concluded from this study that mode of delivery does not affect TSH values of term neonates. Thus mode of delivery need not be taken into account when TSH values, in samples collected at birth in term neonates.

**Source of Funding:** We are grateful to KIMSDU, Karad, Maharashtra, for funding this research project

**Conflict of Interests:** The authors declare that there is no conflict of interests regarding the publication of this paper

**Ethical Clearance:** Taken by Institutional Ethics Committee, KIMSDU, Karad.

**REFERENCES**


The Effectiveness of Acupressure Intervention and Birth Delivery Standing Position to Decrease the Intensity of Labor Pain

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¹Department of Midwifery, Poltekkes Tanjungkarang, Indonesia, ²Department of Business Administration, STIAMAK Barunawati Surabaya, Indonesia

ABSTRACT

Background: Pain is an extraordinary physiological process, and its intensity is generally experienced by almost all mothers differently. Acupressure is one of the non-pharmacological techniques in the management of labor pain. Another method is by employing a standing birth position.

Methods: This is a quasi-experiment with pre-test and post-test groups with the sample of 36 mothers in the acupressure intervention group and 36 others in the standing position group who were based on inclusion and exclusion criteria with cluster sampling technique. Paired T-Test was employed to examine the effect.

Results: The average intensity of labor pain in the acupressure intervention group before the intervention was 6.81 and after the intervention was 2.22. The average power of labor pain in the standing position group before the intervention was 6.81 and after the intervention was 2.56.

Acupressure intervention is more effective than standing position because the average value of the difference in degrees of pain before and after in the acupressure intervention group is 4.583, higher than the standing position which has an average difference in the degree of pain before and 4.250.

Conclusion: The midwives can apply acupressure interventions to minimize interventions with chemical actions or drugs.

Keywords: Labor Pain, Acupressure Intervention, Standing Position

INTRODUCTION

The process of childbirth is marked by an increase in myometrium activity significantly so that contractions become regular and cause pain (¹). Pain in childbirth can affect the mother’s condition in the form of fatigue, fear, worry and cause stress and anxiety which causes the release of the hormone which can cause fetal acidosis (²). Anxiety felt by the mother will have an impact on the stronger sensation of pain that is perceived by the mother, so that not infrequently from some mothers finally decide for cesarean surgery (³).

Various attempts were made to reduce pain in labor, both pharmacologically and non-pharmacologically. Pain management is pharmacologically more effective than non-pharmacological methods. Some non-pharmacological techniques, namely breathing method, movement and position changes, massage, hydrotherapy, hot/cold therapy, music, guided imagery, maternity, acupressure, aromatherapy are ways to improve maternal comfort during childbirth and have a useful coping effect. Towards labor experience (⁴). One popular method of labor induction is acupressure used during labor with the aim of reducing pain and shortening the
duration (5).

This acupressure technique uses pressure, massage and sequencing techniques along the body’s meridians or energy flow lines. Pressure or massage along the meridian line can eliminate existing blockages and improve the body’s natural balance. Acupressure is more focused on the balance of all elements of life by providing stimulation at specific points by using the fingers, palms, elbows, knees, and feet which can reduce pain and make labor time effective, cheap and safe (6).

Another method to reduce labor pain is by giving birth positions. Certain positions can help reduce pain, for example, sitting position, leaning upright, leaning forward, kneeling forward, sorting back or leaning forward (upright / standing position) (7). Usually, 7-14 of women have painless delivery, and almost 90% have labored with pain. 92% of patients experienced new experiences of childbirth, including 66% fear and 78% labor pain (8). Pain causes frustration and despair, so some mothers feel worried that they will not be able to go through labor (9).

Another study of the birth touch proved that with a touch during labor, 56% experienced fewer cesarean action, a decrease in the use of oxytocin and a shorter labor duration of 25% (10). The touch in labor can reduce anxiety, reduce pain and improve comfort, experience significantly shorter labor times, shorter hospital stays and lower incidence of postpartum depression (11).

Research on Acupressure techniques have been widely studied, but researchers will see a decrease in pain intensity in all women giving birth, not only to primiparous mothers. The reason for choosing Metro City, Indonesia as a place to conduct research is because the number of deliveries is quite high, and there are 10% of protective cases carried out by Caesar. Further, previously no research on acupressure intervention, and not all midwives have applied acupressure therapy to reduce pain at the first stage of labor.

**METHODOLOGY**

This research is intervention or quasi-experiment using approaches of pre and post-test design group. The total number of samples was 72 people, namely 36 acupressure intervention groups and 36 standing position groups. The sampling technique used was cluster sampling conducted in Metro City area from July to October 2017. A non-parametric dependent t-test was applied to examine the relationship among variables.

**RESULTS**

The age of mothers in the intervention group of acupressure and the standing position was mostly 20-35 (94.4%). The maternal parity in the acupressure intervention group was primipara (55.6%), while the mother with the standing position group was multiparous (58.3%). The work of mothers with the intervention group of acupressure and the standing position group on average were housewives (94.4%).

The childbirth pain intensity in the acupressure group intervention is depicted in Table 1.

<table>
<thead>
<tr>
<th>Pain Level</th>
<th>Pain Level Before Acupressure (%)</th>
<th>Pain Level After Acupressure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>11.1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>19.4</td>
</tr>
<tr>
<td>2</td>
<td>2.8</td>
<td>27.8</td>
</tr>
<tr>
<td>3</td>
<td>2.8</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>2.8</td>
<td>11.1</td>
</tr>
<tr>
<td>5</td>
<td>11.1</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>11.1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>13.9</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>19.4</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>19.4</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>5.6</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>

The respondents experienced the highest pain degree (10) before the intervention was two people (5.6%) and after the intervention, the highest degree of pain reduced to 5 experienced by two people (5.6%) also.
Table 2: Frequency distribution of pain intensity of birth before and after standing position

<table>
<thead>
<tr>
<th>Pain Level</th>
<th>Pain Level Before Standing Position (%)</th>
<th>Pain Level After Standing Position (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5.6</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>13.9</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>30.6</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>27.8</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>13.9</td>
<td>8.3</td>
</tr>
<tr>
<td>5</td>
<td>8.3</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>8.3</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The highest pain level of respondents before the intervention was 10 experienced by three people (8.3%), and after the intervention, the highest degree of pain was only 5 occurred to 3 people (8.3%).

The result of the statistical test is shown in Table 3.

Table 3: Acupressure and standing position intervention relationships

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>P-value</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupressure</td>
<td>4.583</td>
<td>1.317</td>
<td>0.220</td>
<td>0.000</td>
<td>36</td>
</tr>
<tr>
<td>Standing Position</td>
<td>4.250</td>
<td>1.461</td>
<td>0.244</td>
<td>0.000</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 3 shows that the p-values of the intervention group acupressure and the standing position group are both 0.00 < α (0.05) indicating that there are differences in the degree of pain before and after the intervention in both groups.

For the average value of the difference in pain degrees, the mean acupressure intervention was 4.583, and the mean standing position was 4.250. The data showed that the mean of the acupressure intervention group was more significant than the mean standing position implying that acupressure intervention is more effective than a standing position.

DISCUSSIONS

The pain felt by respondents before being given acupressure is included in the category of mild discomfort to severe pain. Pain is very subjective, not only depends on the intensity but also depends on the mother’s mental state when facing labor. The maternal psychological state will make the mother become stressed or otherwise trigger the release of catecholamine and adrenaline hormones. These catecholamine will be released in high concentration during labor. Acupressure provides the advantage that it can physiologically control labor pain by stimulating local endorphin production and closing gate control or pain gates through the release of large fibers and acupressure is effective in reducing labor pain. Acupressure techniques at points L14 and Bladder 67 can reduce pain and make labor time effective. By stimulating specific points along the meridian system, which are transmitted through large nerve fibers to the reticular formation, the thalamus and limbic system will release endorphins in the body. Endorphins are naturally occurring painkillers produced in the body, which trigger a calming and uplifting response in the body, having a positive effect on emotions, can cause relaxation and normalization of bodily functions. As a result of the release of endorphins, blood pressure decreases and improves blood circulation. Researchers assume that acupressure intervention can be a safe choice and minimal side effects in reducing the degree of labor pain in delivery mothers in the first stage, especially at the point L14 and Bladder 32.

The concept or philosophy of the professional midwife who believes that pregnancy and childbirth are natural/physiological processes is conducted by teaching various kinds of maternity positions. One of the efforts is to condition and seek maternity positions such as upright position/standing which supports labor to be able to walk physiologically. This is also one method that is very helpful in actively responding to pain and reducing the length of labor during the active phase. The upright position in the first phase of active labor can shorten the delivery time of approximately 1 hour and can provide relaxation to blood vessels and can also provide acceleration of head reduction due
to the earth’s gravitational force. The upright position can also improve self-control against pain. There is a slight reduction in pressure in the blood circulation that provides more oxygen to the baby which is very good for both mother and baby (18). Upright and walking positions during childbirth were identical to a reduction in epidural analgesics. The upright position at the first stage is for an attitude that avoids lying flat on the bed without being followed by movement/mobilization during labor when I am active. The first phase of the busy period is a critical phase in the progress of childbirth. Therefore every childbirth helper must be able to control and supervise the labor process so as not to enter into a pathological situation (19).

Acupressure is a form of physiotherapy by giving massage and stimulation to specific points on the body (energy flow lines or meridians) to reduce pain or change organ function. According to the theory of gate control, pain impulses can be regulated or even inhibited by defense mechanisms in the central nervous system, one attempt to close the defense which is a theory of pain relief. This theory says that there is a mechanism gate open on the nerve endings of the spinal column which can increase or decrease the flow of nerve impulses from peripheral fibers to the central nervous system. If the gate is closed, there is no pain, but if the gate is open, there will be a pain. In this case, pain is controlled by an inhibitory action on the pain pathway (20). In this study, pain reduction was influenced by stimulation carried out through acupressure. Acupressure technique has a significant effect on reducing the level of pain as the massages performed at specific points during acupressure therapy make the respondent feel more comfortable and the pain decreases (21).

CONCLUSION

The average intensity of labor pain in the acupressure intervention group before the intervention was 6.81 and the average intensity of labor pain in the acupressure intervention group after the intervention was 2.22. The average intensity of labor pain in the standing position group before the intervention was 6.81 and the average intensity of labor pain in the standing position group after the intervention was 2.56. Acupressure intervention is more effective than standing position, with an average value of the difference in degrees of pain before and after that is 4.583, the average is 0.33 greater than the standing position group with an average difference in the degree of pain before and after 4.250.

Ethical Clearance: The Ministry of Health Polytechnic approved this research in Tanjung Karang, Indonesia. A research permit was requested from the local health authorities. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil

Source of Funding: The Ministry of Health Polytechnic Tanjung Karang, Indonesia.

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Determinants of Vendor-Client Relationship in Medical Equipment Industry

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¹Asst. Professor, Saveetha School of Management, Saveetha University, Chennai

ABSTRACT

Client Relationship Management (CRM) is a practice that retains the existing clients and also acquires new prospective customers. A healthier client rapport custom would perk up the client relation with the company which in turn develop the revenue of the company. This would capitalize on the cross selling and also the up selling. CRM softwares moreover play a predominant role in giving a better experience to the clients and the businesses. This study examines the perception of doctors on their relationship with the equipment suppliers. Moreover, it also deals with the determinant of vendor-client relationships. Data has been collected from 60 doctors who locate in Chennai through questionnaire. The results specify that all doctors experience similar relationship with their equipment suppliers. It also argues that trust and commitment created by suppliers and the quality of equipments predominantly influence the vendor-client relationship.

Keywords: Health care, CRM, medical equipments, doctors.

INTRODUCTION

The medical devices are used in a higher pace in the healthcare industry. The Healthcare professionals play a predominant role in the handling of these medical equipments. The Biomedical equipments fetch enhanced patient care. In this manner, hospitals boost the fulfillment level of the patients. This encompasses pharmaceutical sector, biomedical equipments, biotechnology and so on. When we consider the biomedical equipments industry, it is incredibly essentials they bring about medical innovation. Surrounded by an aging populace and plentiful healthcare issues prevailing, the stipulation for numerous sophisticated equipments is obligatory. For an uninterrupted support to the patients, relationship between vendor and doctors is most vital.

Client Relationship Management (CRM) triggers the conception of high eminence service deliverance and maximizes the client satisfaction. Understanding what the client unerringly wants is the prime feature in CRM. Proactive problem solving, speedy delivery, improvements, knowledge management and global mind-set enhance vendor-client relationships. Moreover, the relational learning of the sales personal also improves client relationship. Communicating with the clients frequently on every occasion when they need answer from the company make them experience a sense of engagement and perk up their loyalty towards the brand. Augmented profitability and efficiency can be obtained all the way through a superior client relationship custom. CRM operate a vital role in having a well-built relationship with the customers. It is obvious that to acquire a new customer is greatly costlier than retaining an old customer. The advertising client agency promotes the positive impacts of the client relationship.

REVIEW OF LITERATURE

Size of the healthcare doesn’t have any impact on the satisfaction level. Research works give directions for assessment of relationship between client and implementation outcome. The relationship aspects comprise of clinicians, client and the court. Nursing leadership is important to continuously assess the quality of healthcare provided. There are differences in supplier i.e. patron. The client-provider relationship not only acts as a therapeutic agent but also acts as a facilitative agent to match the services with the clients’ requirements.

The relationship between vendor and client is becoming more familiar. Effective relationships which in turn improves organization and its project
The agencies misinterpret the basis for the foundation of conflicts inside the relationship. Moreover, incentives influence relationship.

The socioeconomic barriers have been eliminated and healthcare in India is made equitable to all. Indians happen to spend more from their pockets. Trusting involves social practices. Policy makers should address the changing relationship. Dynamic client set is the source of exploitation and exploration.

### Determinants of Vendor-Client Relationship

For assessing vendor-client relationship, primary data has been collected from 60 clients i.e Doctors in Chennai, India through questionnaire method. Doctors are selected based on simple random sampling. The demographic profile of selected doctors is analyzed with the means of frequency analysis. The details include gender and total number of experience in the health care industry. Results of frequency analysis are displayed in Table 1.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>57</td>
<td>95.0</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 includes frequency and its percentage value. It is obvious from the table that majority of the doctors are male with experience of around five years.

The customer base shows the way to the profit margin. Collaborating with the clients and treating them as partners will aid to progress the client relationship with the company. Customer advocacy have an affirmative impact on value of the relationship. The Customer relationship is understood by using the following dimensions – defection, cross-buying, word-of-mouth, motivation, commitment and engagement. The promises specified by the company should be preserved at all times. Customer relationship enhances welfare by dipping the coordination functions and assists the sellers to know about the interrelated buyers’ utility.

The perception about the relationship is measured using promises, responsiveness, problems, respect, management and pleasure.

In order to ascertain the impact of demographic profiles such as gender and years of experience on the perception of doctors about vendor-client relationship, the present study handles independent samples t test and analysis of variance.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Relationship</th>
<th>Gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T</td>
<td>Sig.</td>
</tr>
<tr>
<td>1.</td>
<td>Vendor always keeps the promise (Promises)</td>
<td>1.907</td>
<td>0.63</td>
</tr>
<tr>
<td>2.</td>
<td>Sales personnel are responsive to my needs (Responsiveness)</td>
<td>0.541</td>
<td>0.593</td>
</tr>
<tr>
<td>3.</td>
<td>Company listens to the problem (Problems)</td>
<td>2.004</td>
<td>0.050</td>
</tr>
<tr>
<td>4.</td>
<td>Sales personnel treat me with consideration and respect (Respect)</td>
<td>0.415</td>
<td>0.679</td>
</tr>
<tr>
<td>5.</td>
<td>Opportunity to meet with company management (Management)</td>
<td>0.680</td>
<td>0.499</td>
</tr>
<tr>
<td>6.</td>
<td>We are pleased to have business (Pleasure)</td>
<td>1.333</td>
<td>0.188</td>
</tr>
</tbody>
</table>
Table 2 shows the values of T and F and its significant levels. It is clear from the table that majority of the variables has the significant value of greater than 0.05. It shows that perception about the relationship is not varying based on the demographic profile of the respondents. Doctors have collective perception towards their relationship with vendors.

Customer trust is a responsive behaviour towards what they obtain. This trust makes the company to withstand in the competitive market. It inversely builds up the brand value for the business. The performance of the supplier in providing product quality in addition to sales service quality is important to create trust\textsuperscript{19}. The trust can be constructed by means of intent to take action according to the expectation of the customer and should have the competence towards it. Any kind of interaction with the clients that damages the trust would change the business upside down. Customer loyalty is directly influenced by perceived risk as well as customer trust\textsuperscript{13}. This study uses security, performance, responsiveness, service, transactions and loyalty for measuring the perception of doctors towards trust created by the vendor.

### Table 3: Difference between Trust and Demographic Profile

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Trust</th>
<th>Gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I feel secured when I do business (Security)</td>
<td>T 1.355</td>
<td>F 1.465</td>
</tr>
<tr>
<td></td>
<td>I have belief on product’s performance (Performance)</td>
<td>T 0.899</td>
<td>F 0.424</td>
</tr>
<tr>
<td></td>
<td>Respond to our emergency situations (Responsiveness)</td>
<td>T 0.912</td>
<td>F 0.167</td>
</tr>
<tr>
<td></td>
<td>Risk-free services (Service)</td>
<td>T 1.404</td>
<td>F 0.532</td>
</tr>
<tr>
<td></td>
<td>The Financial transactions are reliable (Transactions)</td>
<td>T 1.333</td>
<td>F 1.235</td>
</tr>
<tr>
<td></td>
<td>Over the last few years, my loyalty had grown stronger (Loyalty)</td>
<td>T 1.332</td>
<td>F 1.532</td>
</tr>
</tbody>
</table>

From Table 3, it is perceived that all the significant values are greater than the prescribed limit of 0.05. It concludes that all doctors have similar perception about the trust created by vendor. Doctors with different gender and level of experience have similar perception.

Commitment to the business will drive to unbreakable relationship and loyalty. Each and every interaction with the client is valuable and creates a partnership value. Always vendors should provide timely service, which would make the clients happy. From sales men perspective, there is a significant relationship between the manufacturers’ quality decisions and the retailers’ sales efforts\textsuperscript{11}. The family plays a key role in the commitment-trust theory\textsuperscript{24}. Table 4 discusses about the impact of demographic profile of doctors on their perception about commitment developed by the suppliers.

### Table 4: Difference between Commitment and Demographic Profile

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Commitment</th>
<th>Gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vendor sights business dealings from a durable perspective (Long-term relationship)</td>
<td>T 2.215</td>
<td>F 2.922</td>
</tr>
<tr>
<td></td>
<td>Company policies fulfill our expectations (Expectations)</td>
<td>T 0.377</td>
<td>F 0.195</td>
</tr>
<tr>
<td></td>
<td>Company’s approach to business says “win-win” situations for both of us (Win-Win)</td>
<td>T 1.486</td>
<td>F 0.837</td>
</tr>
<tr>
<td></td>
<td>The products are customized to our needs (Customize)</td>
<td>T 1.598</td>
<td>F 0.751</td>
</tr>
<tr>
<td></td>
<td>Sales personnel regularly visit me (Regularity)</td>
<td>T 0.228</td>
<td>F 0.506</td>
</tr>
<tr>
<td></td>
<td>Feedback mechanism (Feedback)</td>
<td>T 0.471</td>
<td>F 0.119</td>
</tr>
</tbody>
</table>
Table 4 shows significant values of independent samples t test and analysis of variance. The significant values of both T and F are larger than 0.05 in majorities of cases. Hence, all doctors have identical perception towards long-term relationship, expectations, win-win, customize, regularity and feedback.

The sales revenue increases when the standards are institutionalized. There are two angles from which the quality cues can be examined – intrinsic (reputation of the company) and extrinsic (popularity, price and engagement of the user). Both the intrinsic and extrinsic quality cues affect the sales of the company. This aids to toughen the competitive image of the company in the market. There is a link between the management of the quality system and the service provided after sales. The perception on quality of the merchandise is measured using ideas, delivery, packing, documentation, accessibility and deadlines.

Table 5: Difference between Quality and Demographic Profile

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Quality</th>
<th>Gender</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Vendor offers valuable ideas (Ideas)</td>
<td>1.370</td>
<td>0.176</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Orders placed with vendor are always processed correctly (Delivery)</td>
<td>0.590</td>
<td>0.557</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Packaging is sufficient to guard the merchandise during shipment (Packing)</td>
<td>1.023</td>
<td>0.311</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Deliveries are made with the proper documentation (Documentation)</td>
<td>0.830</td>
<td>0.410</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Company is accessible when I need assistance (Accessibility)</td>
<td>0.803</td>
<td>0.425</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Deadlines are always met (Deadlines)</td>
<td>1.370</td>
<td>0.176</td>
</tr>
</tbody>
</table>

The difference between clients view on quality of equipments and their demographic profile are measured and results are shown in Table 5. The results indicate that significant values generated through all the statistical tools display the value of greater than 0.05. All the doctors have equal amount of perception about quality of merchandise.

Trust, commitment and quality play a greater role in building the relationship between vendor and client. To gauge the extent of influence of above mentioned dimensions on relationship, multiple regression has been executed.

Table 6: Determinants of Vendor-Client Relationship

<table>
<thead>
<tr>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Sig.</th>
<th>R</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.125</td>
<td>0.498</td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Trust</td>
<td>0.056</td>
<td>0.193</td>
<td>0.038</td>
<td>0.012</td>
</tr>
<tr>
<td>Commitment</td>
<td>0.088</td>
<td>0.200</td>
<td>0.053</td>
<td>0.003</td>
</tr>
<tr>
<td>Quality</td>
<td>0.491</td>
<td>0.143</td>
<td>0.444</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Table 6 shows the values of correlation (R), degree of determination (R square), beta and significant value. Degree of determination defines the extent of influence of perception of doctors about trust created by vendors, commitment developed by vendor and quality of the equipments on vendor-client relationship. The perception about relationship is determined to an extent of 63 percentage. Significant values are at one percent level. It is concluded from the table that trust, commitment and quality positively influences the vendor-client relationship.
relationship.

**CONCLUSION**

In traditional CRM, incorporation of sales and marketing was exercised. But for the businesses to survive in future, CRM should be done by integrating sales, marketing and operations. Being a guide to the client and engaging them will aid in enhancing the customer retention. Dimensions of trust and commitment shaped by vendors and quality of the merchandise determine the level of relationship between vendor and their clients. Mass personalization can be followed by companies in order to provide better support. Usage of disruptive technology by handling a business model might improve customer loyalty towards the company. Client referral programs should be developed. Business analytics and Enterprise application integration along with mobile CRM as well as social media integration are popular in recent times.

**Ethical Clearance** - NA

**Source of Funding** - Self

**Conflict of Interest** - NIL

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Macronutrient and Micronutrient Knowledge among Adolescent Girls of Udupi Taluk Karnataka

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ABSTRACT:

Background: The growth and prosperity of a nation depend primarily on the nutritional status and development of the adolescent girls as they not only constitute one tenth of nations’ population but also influence the growth of remaining population. Objective: The study was conducted to assess the macronutrient and micronutrient knowledge of adolescent girls. Method: Community based cross sectional survey was conducted among adolescent girls (N=422) of the selected schools of Udupi Taluk Karnataka. Structured knowledge questionnaire was used to assess the knowledge level of adolescent girls. Descriptive statistics was used to analyse the data. Results: The study results revealed that majority 275 (62.5%) of the adolescent girls were belonged to 15 years of age and most 350 (82.9%) of them were Hindus. Majority, (58.3%) of the adolescent girls were having poor knowledge on macronutrients and micronutrients. Conclusion: There is a need of educational programme on importance of macronutrient and micronutrient intake. These in turn helps to prevent the reproductive related complications in future.

Keywords: adolescent girls, knowledge, macronutrient, micronutrient, Udupi Taluk.

INTRODUCTION

Adolescence is the transitional stage of development between childhood and adulthood and is associated with marked physical growth, reproductive maturation, and cognitive transformations. Girls normally begin their adolescent growth spurt at an earlier age than boys. The growth and prosperity of a country depend greatly on the nutritional status and development of adolescent girls as they not only constitute one tenth of its population but also influence the growth of the remaining population. The word adolescent is derived from the Latin word “adolescere” meaning “to grow”, “to mature”. The WHO has defined adolescent as the age period between 10-19 years for gender. Adolescent during the teenage years of 13 to 19 is the time of dramatic change, the process of physically developing from a child to an adult is called puberty. Nearly 45% of the maximum skeletal mass and 15% of adult height are gained during adolescent phase.

Nutrition and physical growth are integrally associated; optimal nutrition is essential for achieving full growth potential. At the peak of the adolescent growth spurt, the nutritional needs may be twice as high as those of the remaining period of human life. Failure to consume an adequate diet during this period can result in delayed sexual maturation and can arrest or slow linear growth. It was found that the clinical nutritional status of Indian girls in deprived communities was far below the ICMR (Indian Council of Medical Research) as well as NCHS (National Centre for Health Statistics) standards. A study conducted to assess the impact of nutritional knowledge status of adolescent girls on their health in Hisar District of Haryana state revealed that majority (61.62%) of the girls had average nutritional knowledge.

Very few studies were carried out on nutritional knowledge among adolescent girls as most of the research was carried out among under-five children and the researcher could not found any quality studies in this area. All these motivated the researcher to take up this study to assess the knowledge of macronutrient and micronutrient among adolescent girls in selected schools of Udupi Taluk Karnataka.

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Ph. No: + 918453320474
The purpose of the study was to assess the knowledge of macronutrient and micronutrient among adolescent girls in selected schools of Udupi Taluk Karnataka. This knowledge will help to understand the area that is required to be focused in future by further studies which in turn will help the health care professionals to develop recommendations for preventing deficiencies that may burden the reproductive health in future.

MATERIALS AND METHOD

Community based cross sectional survey design was adapted for the present study and data was collected from December 2015 to July 2016.

Study was conducted among adolescent girls studying in selected upper primary schools and Pre-University colleges of Udupi Taluk, Karnataka. Udupi Taluk is comprised of total 89 High schools and Pre University Colleges, out of which 22 are Government schools, 28 are Private Aided schools and 39 are Private Unaided schools. Six schools were selected using simple random technique and cluster random sampling technique was adopted for selecting the study samples.

422 adolescent girls between the ages of 15-17 years constituted the study subjects for the present study. Adolescent girls studying in class 9th, 10th, 11th and 12th were chosen for the study. The sample size was calculated on the basis of pilot study result by using the formula of sample size for estimating the proportion, thus 422 adolescent girls were enrolled for the study.

The Institutional Ethics Committee of Kasturba Hospital Manipal issued ethical clearance certificate (approval no: 683/2015).

Structured knowledge questionnaire was prepared by the investigators by reviewing the literature and discussing with the subject experts and was pretested in a school among five students. The tool was validated with seven experts from dietetic department, nursing department. Investigators gave a score of “1” for each correct answer and “0” for each incorrect answer. The scores were arbitrarily classified as good with a score of 27-36 (>75%), average 18-26 (50%-74%) and poor 0-17 (<50%) respectively.

After obtaining the written informed consent from the subjects, the information regarding demographic characteristics of the subjects was collected by using demographic proforma, modified Kuppuswamy socioeconomic scale and the knowledge on macronutrient and micronutrients were collected through a well-designed structured questionnaire. The variables studied were: age, place of residence, parents’ education, parents’ occupation, and monthly family income, type of dietary habits, menstrual cycles, source of information and involvement in sports activities.

RESULTS

For data analysis, SPSS version 16 was used. Descriptive statistics was used to analyse the data.

Table 1: Frequency and percentage distribution of sample characteristics N=422

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>275</td>
<td>65.2</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>116</td>
<td>27.5</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>31</td>
<td>7.3</td>
</tr>
<tr>
<td>2</td>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Christian</td>
<td>55</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>Hindu</td>
<td>350</td>
<td>82.9</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>16</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Sikh</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>Place of residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>217</td>
<td>51.4</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>205</td>
<td>48.6</td>
</tr>
<tr>
<td>4</td>
<td>Parents education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduate/ postgraduate</td>
<td>216</td>
<td>51.2</td>
</tr>
<tr>
<td></td>
<td>Intermediate or post-high school diploma</td>
<td>36</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>High school certificate</td>
<td>68</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td>Middle school certificate</td>
<td>12</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Primary school certificate</td>
<td>69</td>
<td>16.4</td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>21</td>
<td>5.0</td>
</tr>
<tr>
<td>5</td>
<td>Parents occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Profession</td>
<td>222</td>
<td>52.6</td>
</tr>
<tr>
<td></td>
<td>Semi-proffession</td>
<td>68</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td>Clerical</td>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Shop owner</td>
<td>31</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>40</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>Skilled worker</td>
<td>11</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Semi-skilled worker</td>
<td>15</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>Unskilled worker</td>
<td>24</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>7</td>
<td>1.7</td>
</tr>
</tbody>
</table>
The data presented in Table 1 show that majority 275 (65.2%) of the adolescent girls were at the age of 15 years and most of 350 (82.9%) of the adolescent girls belonged to Hindu religion. The majority of the parents of adolescent girls 216 (51.2%) were having graduate or post graduate education and most of the parents 222 (62.6%) were professionals with a monthly family income of rupees 18,498-36,996, 135 (32%).

Table 2: Frequency and percentage of underlying factors related to dietary pattern

<table>
<thead>
<tr>
<th>Sl.no.</th>
<th>Variables</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ever heard about micronutrient and macronutrient</td>
<td>Yes: 347, No: 75</td>
<td>82.2, 17.8</td>
</tr>
<tr>
<td>2</td>
<td>Source of information</td>
<td>Friends: 29, Health personnel: 17, Parents: 36, Teachers: 239, Books: 25, Magazines: 5, Newspaper: 2, Internet: 2, Television: 1, None: 66</td>
<td>6.9, 4.0, 8.5, 56.6, 5.9, 1.2, 0.5, 0.2, 15.6</td>
</tr>
<tr>
<td>3</td>
<td>Menstrual cycle</td>
<td>Regular: 352, Irregular: 56, Not attained: 14</td>
<td>83.4, 13.3, 3.3</td>
</tr>
<tr>
<td>4</td>
<td>Involvement in sports activity</td>
<td>Yes: 346, No: 76</td>
<td>82, 18</td>
</tr>
<tr>
<td>5</td>
<td>Taking any nutrient supplement</td>
<td>Yes: 230, No: 192</td>
<td>54.5, 45.5</td>
</tr>
<tr>
<td>6</td>
<td>Number of meals per day</td>
<td>1-2: 90, 2-3: 208, 3-4: 114, &gt;4: 10</td>
<td>21.3, 49.3, 27.0, 2.4</td>
</tr>
<tr>
<td>7</td>
<td>Type of diet</td>
<td>Vegetarian: 56, Non-vegetarian: 361, Ovo-vegetarian: 5</td>
<td>13.28, 85.54, 1.18</td>
</tr>
</tbody>
</table>
Data presented in Table 2 show that majority of 347 (82.2%) adolescent girls had heard about micronutrient and macronutrient. Most of the adolescent girls 239 (56.6%) got information from teachers. More than 3/4th 342 (83.4%) of the adolescent girls were having menstrual cycles regularly. Majority 346 (82%) of the adolescent girls were involved in sports activities. Majority 208 (49.3%) adolescent girls were having 2-3 meals per day and maximum 361 (90.25%) of the adolescent girls were non-vegetarians.

The data presented in figure 1 describes that majority 246 (58.3%) of the adolescent girls were having poor knowledge on micronutrient and macronutrient. About 171 (40.5%) of the adolescent girls were having average knowledge and very few 5 (1.2%) were having good knowledge on micronutrient and macronutrient.

<table>
<thead>
<tr>
<th>Knowledge score</th>
<th>Range</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-29</td>
<td></td>
<td>15.58</td>
<td>5.31</td>
</tr>
</tbody>
</table>

The data presented in Table 3 show that the knowledge score for macronutrient and micronutrient ranged between 4 and 29 with a mean of 15.58 ± 5.31.

Further analyses in Table 4 describes the area wise maximum score, mean, standard deviation and mean percentage scores of adolescent girls on macronutrient and micronutrients.

The data presented in Table 4 describe the mean standard deviation and mean percentage scores of different areas of knowledge related to macronutrient and micronutrients. The mean percentage score was highest (55%) in the area of balanced diet whereas in remaining areas the mean knowledge percentage score was below 50% that is in the area of Nutritional requirement (11%), macronutrient and micronutrient deficiency and excess (48%), nutrition and physical fitness (33%) and food items (47.53%) respectively.

**DISCUSSION**

The current study findings showed that majority of the adolescent girls were 15 years of age and most of them were belonged to Hindu (82.9%) religion. More than 50% of the adolescent girls’ parents were having
graduate or postgraduate level of education, but only 23.9% of the parents were having the income of Rs. 36,997 per month. The findings of the present study were supported by a study done by Kotecha PV in 2013 in urban Baroda, India reported that 93% of the adolescent were Hindus, majority of the parents were having graduate level of education and very few parents were having the monthly earnings of more than Rs. 30000/-. The present study findings revealed that 58.3% of the adolescent girls were having poor knowledge related to micronutrient and macronutrients. The study findings were supported by a study done by Alam N (2010) in rural Bangladesh reported that majority of the adolescent girls were not able to name the main food sources of energy and protein and 36% of the adolescent girls were not aware about the importance of taking extra nutrients.

**CONCLUSION**

The present study shows knowledge level of adolescent girls regarding macronutrient and micronutrient was poor. Thus it is very essential for the researcher to assess the dietary recall to identify the deficient areas in terms of macronutrient and micronutrient intake by comparing with RDA values and also sensitizing programmes at school and community level can be planned to avoid the adverse effect of its inadequacy in future especially the reproductive related complications.

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**Conflict of Interests:** There is no conflict of interests.

**REFERENCES**

Health Status of Under Five Children Living in Urban Slums

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ABSTRACT

The primary objective of the research was to study the health status of children under the age of 5 years living in urban slums. This study included 224 under-five Children living in urban slums of Udupi Taluk, Karnataka. A total of 17 urban slums were selected randomly. Cluster random sampling was used. A total of 224 under-five children participated in the study. The mean age of the children was 28±1.6 months. The majority were boys (58.5%). Among the 224 children assessed in this study only 8.5% could be classified as healthy, 40.6% as moderately healthy and 54.5% as unhealthy. In this study, we found that the overall health status of children aged between 1 month to 60 months based on morbidity, immunization status and nutrition status was unhealthy.

Keywords : Health status, under 5 children, urban slums

INTRODUCTION

Health status is a holistic concept that is determined by many factors apart from the presence or absence of any disease. Life expectancy or self-assessed health status often summarize it, and more broadly includes measures of functioning, physical illness, and mental wellbeing. According to the constitution of the World Health Organization, 1948: “Healthy development of the child is of fundamental importance; the ability to live harmoniously in a changing environment is essential to such development.” According to the Census of India, slums have been defined as residential areas where dwellings are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements, design of buildings, narrowness or faulty arrangement of streets, lack of ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety and health. Under-five is the most crucial age group in the growth and development of children. Physical and mental growth occurs mainly in this age group and the risk of child death is the highest in this age group.

Data on urban slum health and health care accessibility of slum populations is very scanty, especially for children living in urban slums. Most of these slum populations consist of migrants and mobile population, with barriers such as a lack of hygiene and sanitation, lack of care, insecurity, under nutrition, lack of access to a proper education, lack of access to health care and a susceptibility to violence. Infectious diseases like diarrhoea, acute respiratory infections and malaria are the world’s leading causes of morbidity and premature death especially in children in developing countries. They can prevent through complete immunization, nutritional supplement, proper care, sanitation and hygiene. Factors like high birth order, younger age, sex, socioeconomic status, poor environmental sanitation, contaminated water and malnourishment were associated with higher incidence of childhood disease.

Inadequate safe food, nutrition, hygiene and sanitation, care and security, education, violence are
the major problems in impoverished urban slums, and the victims are children. Proper nutrition is one of the factors in helping a child achieve healthy growth and development. So there is a need to study the status of children’s health, which will help in implementing interventions and making recommendations to improve the health condition of the urban slum child population.

**METHODOLOGY**

This community-based cross-sectional study was designed to assess the health status of under-five children in urban slums of Udupi Taluk, Karnataka. Cluster random sampling technique was used. A total of 17 urban slums were selected randomly. Complete enumerations of eligible mothers of under-five children from all selected slums was carried out. A structured and validated questionnaire was used for collection of data on background information about the family and household characteristics, personal hygiene, common childhood diseases (fever, cough, diarrhea, pneumonia, skin, ear and eye infections, angular stomatitis and dental caries), general appearance, immunization status, nutrition status and mother’s health-seeking behavior during a child’s illness. Nutritional status of under-five children was assessed by taking anthropometric measurements like height, weight and Z-score which were calculated according to the National Centre for Health Statistics’ (NCHS) reference data for age and sex of a child. Children were classified as underweight and normal weight; under nutrition was defined as weight for age less than -2SD of the NFHS reference. The weight of the under-five children was measured using a digital weighing machine. To ascertain the information about immunization coverage, the respondent was asked to provide their immunization card, if they had any. In the case of unavailability of the card, information regarding the administration of vaccines was recorded on the basis of the respondent’s memory. For BCG, the immunization was assessed by the presence of the scar.

Protocol approval was taken from the Institutional Ethics Committee. Written informed consent from all the participants was taken before conducting the study. The data collected was numerically coded in SPSS-16. The data was summarized using descriptive statistics, frequencies and percentages. Statistical differences between categorical variables were assessed using the Chi-square or Fischer exact test (if cell value was less than 5). Means were compared using the Student’s T-test. P-value <0.05 was considered statistically significant.

**RESULTS**

A total of 224 under-five children participated in this study. The mean age of the children was 28±1.6 months, and 58.5% were boys. The mean age of the mothers was 22.9 ±4.3 years: the range was from 16 to 40 years. The mean age of the fathers was 32.4±2.5 years (range:17 to 40 years). Out of the parents included in the study, 67.4% of mothers and 35.3% of fathers were illiterate; 94.6% of mothers and 97.8% of fathers were daily wage labourers; 5.4% of mothers were housewives and 2.2% of fathers were self-employed; and half of the families had only two children (mean children was 2.7±1.08). Almost two-third (64.3%) of families had one under five child, and remaining families had two under-five children. About 86% of the respondents were Hindus; 62.1% had a monthly family income below Rs.5000; and 88% of the respondents were living in kutcha houses. The mean occupants in a household was 7±2 (range 4 to 14 members); 84.4% of households had drinking water facility in the slums or within one kilometre of the slums; and 76.3% people did not use any method to purify drinking water while 23.7% used boiling as a purifying method. Almost two-third of the households did not have toilet facility; cooking in 74% of households were inside the house; and 73.2% of respondents did not use mosquito nets.

Figure 1 shows the morbidity conditions. Skin infection and cough constituted 45.1% and 44.6% of morbidities respectively, followed by fever (30.8%), pneumonia (27.7%), diarrhoea (24.1%), injuries (22.8%), angular stomatitis (21.9%), ear infection (21.4%) and eye infection (7.6%). Table 3 shows that 61.2% of respondents showed their immunization card during data collection whereas 38.8% of respondents did not possess any card/document. Based on the availability of the immunization card, 38.8% of under-five children were fully immunized whereas 61.2% of them were partially immunized. This study revealed that 33.6% of children were underweight/malnourished. 8.5% of children were healthy, 40.6% of children were moderately healthy and 54.5% of children were in poor health.
Table 1: Socio-demographic background of under-five children and their parents, N=224

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (in months)</td>
<td>&lt;12</td>
<td>24 (10.7)</td>
</tr>
<tr>
<td></td>
<td>12-23</td>
<td>61 (27.2)</td>
</tr>
<tr>
<td></td>
<td>24-35</td>
<td>68 (30.4)</td>
</tr>
<tr>
<td></td>
<td>36-47</td>
<td>30 (13.4)</td>
</tr>
<tr>
<td></td>
<td>48-60</td>
<td>41 (18.3)</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>26.8 ±1.6 months</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>131 (58.5)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>93 (41.5)</td>
</tr>
<tr>
<td>No. of children in the household</td>
<td>1</td>
<td>15 (6.7)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>102 (45.5)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>60 (26.8)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>32 (14.30)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>10 (4.5)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5 (2.2)</td>
</tr>
<tr>
<td>Total number of under-five children in the study households</td>
<td>1</td>
<td>144 (64.3)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>80 (35.7)</td>
</tr>
<tr>
<td>Age of father</td>
<td>Mean &amp; SD</td>
<td>32.4 ± 2.5 years</td>
</tr>
<tr>
<td>Age of mother</td>
<td>Mean &amp; SD</td>
<td>22.9 ± 4.3 years</td>
</tr>
<tr>
<td>Literacy level of father</td>
<td>Educated</td>
<td>145 (64.7)</td>
</tr>
<tr>
<td></td>
<td>Not educated</td>
<td>79 (35.3)</td>
</tr>
<tr>
<td>Literacy level of mother</td>
<td>Educated</td>
<td>73 (32.6)</td>
</tr>
<tr>
<td></td>
<td>Not educated</td>
<td>151 (67.4)</td>
</tr>
<tr>
<td>Occupation of father</td>
<td>Daily wage worker</td>
<td>219 (97.8)</td>
</tr>
<tr>
<td></td>
<td>Self employed</td>
<td>5 (2.2)</td>
</tr>
<tr>
<td>Occupation of mother</td>
<td>Daily wage worker</td>
<td>212 (94.6)</td>
</tr>
<tr>
<td></td>
<td>Housewife</td>
<td>12 (5.4)</td>
</tr>
</tbody>
</table>
Table 2: Facilities and hygiene practices in surveyed households, N=224

<table>
<thead>
<tr>
<th>Facilities / practices</th>
<th>Categories</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking water facility</td>
<td>Yes, in the slum/within 1km</td>
<td>189 (84.4)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>35 (15.6)</td>
</tr>
<tr>
<td>Measures to improve safe drinking water</td>
<td>Boiling</td>
<td>54 (24.1)</td>
</tr>
<tr>
<td></td>
<td>Nothing</td>
<td>170 (75.9)</td>
</tr>
<tr>
<td>Cooking facility</td>
<td>In the house</td>
<td>165 (73.7)</td>
</tr>
<tr>
<td></td>
<td>In a separate building (kitchen separate)</td>
<td>12 (5.4)</td>
</tr>
<tr>
<td></td>
<td>Out door</td>
<td>47 (21.0)</td>
</tr>
<tr>
<td>Defecation practices</td>
<td>Closed defecation (public/shared toilet)</td>
<td>79 (35.3)</td>
</tr>
<tr>
<td></td>
<td>Open defecation</td>
<td>145 (64.7)</td>
</tr>
<tr>
<td>Residual spray in past 12 months</td>
<td>Yes</td>
<td>53 (23.7)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>91 (40.6)</td>
</tr>
<tr>
<td></td>
<td>Don’t know</td>
<td>80 (35.7)</td>
</tr>
<tr>
<td>Use of mosquito nets</td>
<td>No</td>
<td>60 (26.8)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>164 (73.2)</td>
</tr>
</tbody>
</table>

Table 3: Health status of under-five children based on morbidity, immunization and nutritional status, N=224

<table>
<thead>
<tr>
<th>Status</th>
<th>Categories</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td>Have morbidity</td>
<td>174 (77.7)</td>
</tr>
<tr>
<td></td>
<td>No morbidity</td>
<td>50 (22.3)</td>
</tr>
<tr>
<td>Immunization</td>
<td>Fully immunized</td>
<td>87 (37.1)</td>
</tr>
<tr>
<td></td>
<td>Partially immunized</td>
<td>141 (62.9)</td>
</tr>
<tr>
<td>Nutritional</td>
<td>Under nutrition</td>
<td>73 (32.6)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>151 (67.4)</td>
</tr>
<tr>
<td>Overall health status based on morbidity, immunization status and nutrition status</td>
<td>Healthy</td>
<td>19 (8.5)</td>
</tr>
<tr>
<td></td>
<td>Moderately healthy – only one condition not satisfied</td>
<td>91 (40.6)</td>
</tr>
<tr>
<td></td>
<td>Unhealthy – more than one condition satisfied</td>
<td>122 (54.5)</td>
</tr>
</tbody>
</table>
DISCUSSION

The present study was conducted to assess the health status of under-five children living in the urban slums of Udupi Taluk, Karnataka. The study results reveal that a majority of the under-five children were unhealthy. Only 19 out of 224 children could be classified as healthy. This study shows that 33.6% of under-five children were underweight. Basu D et al. reported similar findings. Under nutrition was high among children of illiterate mothers (63.8%). Children of working mothers were affected more by morbid conditions (96.6%) as compared to homemakers. Morbidity was also found to be high among children belonging to low income families (66.1%) and low socioeconomic background (93.1%). Similar findings had been reported by Tada Y et al., Abuya BA et al. and Safikul Islam et al.

The most common morbidities in the under-five children were skin infection (45.1%), fever (30.8%), cough (44.6%), pneumonia (27.7%) and diarrhoea (24.1%). This is similar to the findings seen by Adhikari D et al., Srivastava DK et al. and Taffa N et al. These morbidities were then correlated with factors like a lack of personal hygiene, mother’s age, education and occupation, family income and type of household which is similar to findings of other studies. Ujwala U et al. observed a higher prevalence of morbidity (82%) among under-five children. In this study, 38.8% of under-five children were fully immunized. 65.1% of male children were fully immunized. BCG vaccination was given to 90.2% of children but vaccination coverage for measles was only 28.1%. These findings are similar to a study conducted by Sharma R et al. where total immunization coverage was 25%, BCG vaccination coverage was 75% and measles vaccination coverage was 29.9%. This study also shows that the number of children of younger parents who were fully immunized was more than those of elder parents (mean age of fully immunized children’s mother was 22.5±4.4 and fathers was 30±6.5). Majority of the fully immunized children parents had less number of children (mean number of children in family was 2.5±4.2). Lower aged children were fully immunized as compared to higher aged children (mean age of fully immunized children was 29±7 months). Among the fully immunized children, 73.5% of their fathers and 34.9% of their mothers were educated. This is found to be consistent to a study conducted among 746 rural and urban migrant mothers with a child aged up to 2 years by Kusua YS et al. It was also found that mother’s age; educational status; the frequency of health care use; head of the family’s education, job and salary were significantly associated with full immunization coverage. Banerjee J et al. found that 43% of the mothers did not have the immunization card of their child, which is consistent with the present study.
CONCLUSION

In this study, we found that the overall health status of children aged between 1 to 60 months living in urban slums based on morbidity, immunization status and nutrition status as unhealthy. The most commonly morbidities observed were skin infection, cough, fever, pneumonia and diarrhoea. More than one third of children were under-weight, and under-weight was slightly more among male children. Majority of the children were not fully immunized, and immunization coverage was higher among boys. Safe drinking water, water supply, sanitation, hygiene, age of the child, mother’s and father’s education, mother’s occupation and age, number of children in the family, usage of mosquito nets, type of household, family incomes were significantly associated with health status of the children.

Limitations

Morbidity status was based on self-reported signs and symptoms, which were not confirmed by clinical examinations or diagnostic tests. Immunization status might be under-reported, as the immunization card was used to verify immunization status in this study. Many of the parents could not produce the card at the time of data collection. Only weight for age was used to assess health status of children in this study. Several respondents refused to give written consent although they were ready to participate and gave verbal consent.

Recommendations

Health awareness activities regarding morbidity conditions like skin infection, fever, cough, pneumonia and diarrhoea are done through community health workers routine health check-up and strengthening immunization coverage in collaboration with the Government and private health sectors. Provision of health care should be made accessible for mobile and migrant slum population without any documentation. Provision of basic needs, adequate and safe drinking water supply, toilets, mosquito nets and shelter for healthy livelihood in the slums. Sanitation and hygiene practices in the slums should be improved, which are closely associated to child health.

Ethical Clearance- Taken from Institutional ethics committee

Source of Funding- Self

REFERENCES

Is Telemedicine Best Alternative to Reaching Last Mile:
Investigation in the Context of Rural India

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ABSTRACT

Technology has played a role in the quality and assurance of life. Application of technology in the healthcare field has increased manifolds in past decade with the development of new devices and IT. Telemedicine – a technology for remote diagnosis of diseases provides health care facilities to the remote area. In the context of India, telemedicine can be an option to provide healthcare facilities to last mile, the interior villages with the help of technology. Although it is a conceptual paper, the paper investigates the enabler of telemedicine technology adoption and implementation and ends up with the proposed model with the constructs and constructs definitions with the proposed items which are useful for telemedicine implementation. Through the systematic literature review followed by one to one interaction with the physicians, patients and telemedicine experts who all are currently using the technology the propositions are made which are likely to affect the implementation and adoption of telemedicine technology. telemedicine is a useful technology, when it comes to the affordability, quality and reach of healthcare services in India. Private hospitals as well as government both have to work together to provide the better healthcare for better India.

Keywords: Telemedicine; Healthcare; rural India.

INTRODUCTION

Technology has always played an integral role in human social life. While some technology applications improved the standard of living, some other technology improved the very quality and assurance of life. Technology, rather application of technology in healthcare field have increased manifolds in the past decades with the development of IT infrastructure. Innovative technology applications in healthcare sector have to a large extent revolutionized healthcare delivery to patients across the globe. The field of telemedicine has gained considerable focus in this regard and has become a buzzword in the context of online and IT enabled healthcare delivery to the remote corners or the last mile healthcare service delivery foray and various practitioner and contemporary academic literature suggest that indeed it has been effective in saving lives.

But in a country like India where large chunk of population lives in rural areas and often remote areas as well, though the promise of telemedicine carries lots of ideology and prospect, but how effective it is actual scenario in reaching to the needs of the poverty-stricken village people in often infrastructure-starved villages, looms large as a big question. This study is aimed at carrying out separate exploratory studies regarding the intent of use of telemedicine, under what circumstances telemedicine in rural India is most effective, whether in private or public setup telemedicine works well and for what kind of diseases. Time saving and cost savings, both these aspects though often linked with practice of telemedicine, however use of this technology and its acceptance depends upon the complexity of diseases and
complexity of technology. Use of the technology will increase only when the patients as well as the doctors accept it. This study tries to understand the perception of the grass-root level patients and their perception and intent of use and acceptance of telemedicine as an alternative to travelling far distances to nearby metros or large cities. This paper describes in which situations telemedicine technology can be effectively used, what are the factors affecting the usefulness of the technology. The responses of doctors and patients are taken to know the intent of use of the technology.

**LITERATURE REVIEW**

Telemedicine is use of telecommunication technologies to provide medical information and services. It is a digital platform which provides diagnosis as well as treatment of disease where the Expert or the Medical Practitioner can diagnose the disease and/or provide the medical help along with the prescription for the medicine. Telemedicine technology enable these work from the remote location, so the expert can give the medical advice to the patient or client who are in remote locations and who could not reach the hospital in case of emergency.

In recent times Indian Healthcare Sector is fighting with the three major issues. And telemedicine has ability to resolve all the three major issues. Quality of care, Access to Care, Affordability to Care. Available WHO statistics shows that there are less than 1 physician per 1000 population and in India there are only 0.797 physician per 1000 population (WHO data 2016).

Telemedicine increases the speed of healthcare and medical services as Medical Experts as well as patients does not have to travel for long distance as the same work can be done from the remote location. By using the telemedicine one medical expert can reach more patients as compare to the traditional medical practices as well as medical experts can form the collaborative network to share their knowledge to provide the better healthcare. Thus one expert can be accessible to more number of patients. On the other end, India is divided into Metro, Semi metro cities, towns and villages. Metro and Semi metro cities have good healthcare facilities in compare to towns and villages. So, the person who is living in a village or town must go to the metro and semi metro cities for good healthcare services. But exploitation of Information Communication technology for Health (ICT4H) can potentially bridge the gap between urban and rural healthcare. Thus, telemedicine can provide the access to the quality healthcare services.

With the decrease in travel time and treatment quality as patient can take the healthcare services from the best in class medical experts who practices in urban area, telemedicine is also able to decrease the cost for treatment. Hence, it is possible to provide affordable and quality healthcare services to the village people, as well as to the urban people who are below the poverty line. With some mobile applications patient also have a flexibility to choose for a medical experts associated with the services and take the best in class healthcare treatment.

**METHODOLOGY**

The study follows a two stage methodology for initial model formation and conceptualization. For the conceptualization part, systematic review of relevant academic and practitioner literature have been done followed by in-depth scenario understanding through one-to-one discussions with few key stakeholders like physicians, patients, and technology experts. Systematic literature review has been followed by focused group discussion aiming at understanding the underlying practical linkages and subsequently followed by in depth interviews with semi structured questionnaires. Certain key aspects emerged out of as dominant enablers which hints towards providing key insight about the factors which can predominantly dominate the adoption and use of technology.

In the second phase due to dearth of enough empirical evidences, this study used a mix of two parallel techniques namely case-based modelling and q-sorting with industry experts as an alternative to pre-pilot and pilot studies. Through Q-sort technique the study tried to incorporate an alternate investigative viewpoint using telemedicine implementation experts and physicians involved in similar fields. Through Q-sorting three aspects were closely monitored: Inter-rater reliability, Cohen's kappa and raw agreement scores and the study continued for three rounds with distinct sets of experts till all the three values above 0.9 were achieved. However since in q-sorting the subjective perspectives of the experts were only taken into consideration, we have substantiated our claim through development of two fact-based realistic cases in the context of already
running telemedicine projects in Indian context to add to the clarity and get a more nuanced understanding about the factors affecting telemedicine implementation and adoption. From the systematic literature review, semi structured focused group interview followed by Q-sort, and small case based propositions this study goes forward to put forth five key propositions which carry immense managerial and practitioner implications.

**Case Study**

While we were in the process of focused group discussion with the telemedicine technology experts, physicians and patients, we have made two distinct case studies which portrays in lucid manner how telemedicine facility can work, what are the facilities that are needed for a telemedicine center, and how well it can impact the adoption and implementation of telemedicine technology; thereby aiming at providing better healthcare services.

**Case Study - I**

A prominent Pan-India private healthcare service provider, with key multi-speciality chain hospital network spread across India, has developed telemedicine network and has been providing telemedicine services in almost all states of India, and nine overseas countries from their seven tertiary care facilities across the country. Patients have been evaluated from the distances ranging from 120 to 4500 miles. Facilities are available for tele-auscultation and for transmitting and viewing an echocardiogram live from a few centers. facility has custom-made Web-based software platform, which is used by many peripheral centers in the network, to transmit electrocardiograms (ECGs), images (x-ray films, computed tomography [CT] scans, ultrasound pictures, MRI and other reports.

In India where there is dearth of electricity and power outages are common, if due to some network or technical error web based live tele-consultancy process gets stuck up, this telemedicine service provider have designed process backups like transcript emailing and diagnosis mailing to avoid ambiguity and synchronize incomplete consultations. Even storage, retrieval and re-evaluation facilities are also provided to distant patients and concerned physicians from the quaternary care centers. All the teleconsultations are recorded and stored on a server. The facility uses broadband, ISDN line or VSAT (Very Small Aperture Terminal) for transmitting data, images, video, audio and provides a superior healthcare in the IOT environment (internet of things). All process level cross-checks prevent variability and enhances standardized care service delivery.

**Case Study - II**

The second case is in the context of rural telemedicine, service their rural outposts from metropolitan centers. This leading telemedicine service provider have been serving in rural India, from its metropolitan centers, using hub and spoke model for delivering better healthcare. The facility provides the training and motivates physician by lucrative incentives for telemedicine, as physician’s involvement and motivation towards technology will leads to the adoption and implementation of telemedicine. The facility has a technology for video conferencing and transmitting, image, audio, video text towards both the ends. The facility also runs a short term course for the device operators who are working at quaternary care centers. The facility is in a process of developing the m-healthcare also, which uses 3G/4G mobile communication technology and android as well as iPhone application development for health related and consultancy related issues for the urban people, who cannot afford to be in a queue for the long time. The service provider in collaboration with one of the most prominent indigenous portable healthcare device manufacturer, through usage of mobile-mounted attachments have been trying to reduce time lag between clinical study, reporting and evaluation based diagnosis aiming at treatment time optimization and bolstering video calling or chatting with the medical experts for accurate the diagnosis and care delivery. These are aimed at enhancing the pervasiveness and standardized care delivery practice by prescription mailing to the patient with all the necessary reports generated by experts at telemedicine facility to increase trust building between technology, doctors and patients and trying to mimic the existing care delivery practices in brick and mortar setups.

**Proposition development**

As per Technology Acceptance Model (TAM), when a user finds that it is easy to use the technology, which includes all the interfaces of technology than person shows the intention to use the technology and becomes technology savvy. As it is easy to use a technology for a tech savvy person, it is likely that person will use the
telemedicine technology.

P1 – Technology savviness will leads to the implementation of telemedicine

As telemedicine includes use of a telecommunication technology\(^2\) for healthcare services, the physical interaction between physician – patient is not mandatory\(^6\), but diagnosis can be done remotely by a doctor.

P2 – Telemedicine implantation will leads to the remote testing diagnosis

Patient can consult for one or more doctors or take the second opinion from the other doctors for the medical condition, and have a swift access to the doctors\(^10\), as web based application is used.\(^7\)

P3 – Telemedicine implementation will leads to the choice flexibility

Reports and medical records are the personalized documents and cannot be given to the unauthorized person for access.\(^6\) On the other end, patient must have the access of own reports. With the implementation of telemedicine, information transparency is created, as web based applications are used.

P4 – Telemedicine implementation will leads to the information pervasiveness

As telemedicine enables remote diagnosis, patient does not have to wait in a long que at doctors’ clinic. Rather from the application patient can consult a doctor online. Which leads to lower the treatment time without hampering the treatment accuracy.\(^3\)

P5 – telemedicine implementation will leads to the treatment time optimization

Outcome of study

The major contribution of this paper is to identify the constructs which can act as an enablers for the adoption of telemedicine technology, and based on Q-Sort, we have defined construct definitions and proposed indicators which are likely to affect the adoption of technology.

Choice flexibility can be defined as an extent to which patient can have a swift access to the medical expert for having an opinion and advice to better manage the medical conditions. Which indicates that patient has a choice to select one or more doctors (consultation as well as second opinion) for the healthcare services irrespective of time.\(^7\)

Treatment time optimization is defined as an extent to which interaction time between doctor – patient is untouched with decrease in ravel time. As doctors and patients don’t have to contact physically as remote diagnostics is there, proper treatment can be given to the more patient in the same time in compare with the traditional practices as travelling time can be eliminated.\(^5,3\)

Transparency of information is an extent to which the record of patient data is shared with the patient using a secure gateway. As patient has a right to see the nature of treatment given and all other reports related to the health. Report sharing also increases the patient’s responsibility and awareness towards health as patient is responsible for own health.\(^6\)

Remote diagnosis testing can be defined as an extent to which diagnosis can be done by using technology, tools and media from a distant place. As patient – doctor both can use the web based application for the diagnosis
and other healthcare services both does not have to travel along the long distance for getting healthcare services.2,5,7

Implications

Managerial Implications

For implementation of telemedicine hospital management must invest on it, as telemedicine is able to provide high returns on investment as only one time technology cost is there, but after implementation more patients can be handled swiftly which increases the patient’s satisfaction. For the constraints related to technology Indian Space Research Organization (ISRO) has already launched a satellite, for an exclusive use of telemedicine and healthcare technology, which can has a wide reach and range of connectivity. Hospital management also supports the training program for the telemedicine operations for doctors and telemedicine operators, as training can motivates the usefulness, adoption and implementation of technology.

Society at large

Government should also take the initiatives and make a telemedicine center at government hospitals in a metropolitan city, on the other end, primary healthcare center or “Aanganwadi” in the villages should be made as a teleconsultation program – which is connected with one or other hospitals with government as well as private telemedicine set up. Which can provide the access to healthcare on an affordable basis to the large population.

Academic Implications

Researchers and scholars can remove the technological as well as managerial constraints which are hurdle in the implementation and adoption of technology. moreover, how to enhance the reach and adoption for telemedicine especially in India, as India is a country with wide variety of geography, psychology (of people) and interior villages where reach is an issue. Moreover, in which disease condition and for which disease how telemedicine technology can be used effectively and efficiently is an area for research.

Future Scope

Scope of converting the proposition into testable hypotheses to be tested empirically.

Ethical Clearance:

As it is management study and no experimentation done in the laboratory no ethical clearance needed

Source of Funding: Self

Conflict of Interest: Nil

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Improvement of Job Engagement after doing Team Job Crafting in Human Resource Management of Hospital

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ABSTRACT

Job crafting is becoming popular in term of job design in human resource management. Employees involved in crafting behaviors can change the number, methods, or form of jobs (task changes), how they consider their jobs (cognitive changes), and how they interact with people related to their work (relational boundary changes). Team job crafting is a collective process about what to craft at work and how in order to achieve mutual goals. This paper is a case study conducted at Airlangga University Teaching Hospital to know whether team job crafting may affect job engagement level. The intervention has been performed since January 2017. Job engagement level is measured using (Utrecht Work Engagement Scale) UWES questionnaire. The UWES score is measured before and after interventions and then analyzed statistically. After doing team job crafting, there are significant improvements in job engagement level. Total score of UWES in 2017 is significantly higher compared to 2016 (p<0,00; CI = 95%). All aspects of job engagement are also improved significantly. Improvement of job engagement after doing team job crafting is linear with what is expressed in much previous research. In term of task changes, the members of the team may change the way of work and work behavior that suitable not only their desire but also others. In term of cognitive changes, there is shifting on the perspective of work linkage. Every worker sees work no longer merely as an individual job, but also within a team. In relational boundaries, changes in attitude of each individual affecting the work atmosphere became more comfortable. Team job crafting is proven may increase the job engagement of staff. Further research should be made in larger scale in order to make a firm conclusion.

Keyword(s): job engagement, job crafting, team, hospital, human resource management

INTRODUCTION

Job crafting is becoming popular in term of job design in human resource management. The first conceptual of job crafting was written by Wrzesniewski and Dutton (1). Employees involved in crafting behaviors can change the number, methods, or form of jobs (task changes), how they consider their jobs (cognitive changes), and how they interact with people related to their work (relational boundary changes) (1–3). Employees who change any one of these aspects can modify the job design and the social environment in which they work (1,4).

Job crafting can increase job engagement thus increasing work performance (5–7). The level of job engagement is known correlated with work performance. Higher job engagement can motivate the staff to make improvement of overall performance (8,9). A meta-analysis conducted by Rudolph et al. in 2017 shows that job crafting is useful in increasing work performance, including in healthcare area (2).

Leana et al. (2009) stated that job crafting can be categorized into two classifications: individual job crafting and collaborative job crafting (10,11). Individual job crafting refers to a person who plays actively in modifying their task and shaping the fitness of his/
her work practice. Collaborative or team job crafting defined as employees who jointly make an effort to determine how to change the task boundaries to fulfill their shared work goals. Team job crafting is a collective process about what to craft at work and how in order to achieve mutual goals (11–13). Team job crafting requires interaction between team members but is more than simply discussing and setting the team’s daily work agenda (2,13). This changing of job characteristics is a bottom-up process, where employees themselves, not management, decide as a team which features of their job they would like to modify (13).

The evidence shows that performance of an organization depends on the level of employee engagement (8,9,14). By using UWES questionnaire of job engagement, it was shown that the engaged status in 2016 in National Insurance Casemix Unit is only 18% of members with average score 59.7. When an employee is engaged they work better and therefore contribute more to the organization’s ongoing profitability (8,10,15). Therefore, it was assumed that the low performance caused by the low job engagement.

METHOD AND MATERIALS

This paper is a case study conducted at the National Insurance Case Mix Unit in Teaching Hospital of Airlangga University, Indonesia. The human resource in the unit consists of multi professions: coder, administrator claim, finance staff, and medical doctor.

The hypothesis of this study is team job crafting may affect the job performance level. The job redesign was performed using team job crafting by creating task changes, cognitive changes, and relational boundaries improvement. After doing a transfer of target, all of the processes were a bottom-up approach. All members were elaborating to decide which job will be the responsibility of whom. The whole systems in work were also changed through mutual agreement. The mindset of all members was changed from a passive worker into an active worker. The cognitive aspects were also changed by doing a weekly report of the unit instead of usual monthly report. The unit can also suggest things they think should be improved to make relational boundaries improved, such as the employee of the month program by themselves and also doing outbound.

Job engagement level was measured using UWES questionnaire. Measurement of job performance in this research is done by using UWES (Utrecht Work Engagement Scale) compiled and used first by Schaufeli (2002). UWES is the most common questionnaire tool used by researchers around to measurement the job engagement level. Questionnaire consists of 17 questions followed by score ranged from 1 (very unimportant) until 6 (very important). In the questionnaire sheet there is the identity of the respondent, such as: name, age, gender, education last, and length of work. The UWES questionnaire has 17 questions be marked with three aspects, including: vigor (6 question), dedication (5 question), absorption (6 questions), with answer choices very unimportant, unimportant, rather unimportant, rather important, important and very important with a score of 1 until 6. After the questionnaire is filled, the score from each question will be accumulated.

The instrument used on research uses (Utrecht Work Engagement Scale) UWES questionnaires to measure work engagement score on human resources in the unit. This scale is annually done by the hospital to know the engagement level of staff. The results of this test are compared between 2016 and 2017. Based on reliability test results with alpha cronbach with SPSS studies Titien (2016), indicating that level corrected item-total correlation shows ranges from 0.430 to 0.848 with reliability coefficient of 0.934. Reliability coefficient value it shows that work engagement score has good homogeneity. Since the intervention was performed in January 2017, the data from July 2016 – December 2016 is compared to the data from January 2017 – December 2017.

RESULTS AND DISCUSSION

After doing team job crafting, there are improvements in job engagement level. Total score of UWES in 2017 is significantly higher compared to 2016 (p<0.00; CI = 95%). In 2016, average score 50.9 (33 - 64) and was obtained significant increase in 2017 with average score 81.1 (77 - 84). The detail results of UWES is shown in Table 1. Three aspects of UWES are increased significantly: vigor, dedication, and absorption.
Table 1. UWES result before and after intervention

<table>
<thead>
<tr>
<th>Scale</th>
<th>Before</th>
<th>After</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Engagement</td>
<td>50.9 (33 – 64 ± 7.95)</td>
<td>81.1 (77 – 84 ± 2.34)</td>
<td>0.000</td>
</tr>
<tr>
<td>Vigor</td>
<td>16.9 (9 – 22 ± 3.53)</td>
<td>28.1 (24 – 33 ± 2.62)</td>
<td>0.000</td>
</tr>
<tr>
<td>Dedication</td>
<td>15.2 (9 – 20 ± 3.28)</td>
<td>23.3 (22 – 25 ± 1.12)</td>
<td>0.000</td>
</tr>
<tr>
<td>Absorption</td>
<td>18.7 (14 – 27 ± 3.79)</td>
<td>29.6 (27 – 34 ± 1.91)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The term of team job crafting is defined as proactive behavior through which team members change their work environment by jointly shaping the team’s job resources and job demands (13,17). In this study, team job crafting was performed by creating task changes, cognitive changes, and relational boundaries improvement. The changes were made by staff proposal based on daily experience.

According to Lyubovnikova et al. (2015), the team is when members share clear objectives in doing work/task. The team members also work interdependently, in this study the claim verification result is a multidisciplinary product that includes targets for each individual (13,18). Consequently, the target of the teamwork is a product of professional skills across different disciplines and is thus shared. Teams moreover reflect regularly on the effectiveness of their work and continuously update their way of working on the basis of feedback collected after every process of claim series. Second, owing to their daily meetings, they provide an exceptional opportunity to investigate real team processes, such as team job crafting, on a daily basis.

Improvement of job engagement after doing team job crafting is linear with what is expressed in much previous research (6,10,19). In term of task changes, firstly each member in unit identifies the work that has to be completed each day. Then as a team, they tried to develop methods that suggested to be implemented. Based on mutual agreement, the method of work was also modified based on teamwork perspective. In addition, the unit also proposes to create new rooms in order to support changes in the flow of their work. Job crafting can make a staff more involved in decision-making related to his work. They may change the way of work and work behavior that suitable not only their desire but also others. So that team interactions can be sustain and continuous adjustment from one another may happen continuously.

Teams who actively craft their jobs and shape their work environment are seeking to acquire new job resources that will enable them to cope better with their job demands and achieve their shared objectives. Research has provided sound evidence of the benefits of team job crafting, relating not only to positive employee attitudes to work but also to improved team efficacy and interdependence and increased levels of work engagement and performance (11,13,17). There is also recent evidence that, in contrast to individual job crafting, shared job crafting among team members increased their team’s performance (12,20).

In term of cognitive changes, there is shifting on the perspective of work linkage. Every worker sees work no longer merely as an individual job, but also within a team. Each team member is responsible for the performance of each, but the KPI of the unit must also be achieved. In the case of training needs, all are determined by the team. Every worker also made a change of mindset from previous passive workers in the sense of waiting for work, becoming active workers. Active workers, in this case, can also exercise control over the results of other workers that he does interaction of daily work. That way, there are continuous improvements between jobs with each other.

Improvement also occurs in relational boundaries, ie changes in attitude of each individual affecting the work atmosphere becomes more comfortable. Each worker also feels the job is more interesting because the interaction within the team gets better so that it can decrease the level of boredom of the employee. In addition, they also awarded employee of the month for the elected team member by their own. The criteria include discipline, friendliness to others, politeness, and well manner. This can further increase work motivation which ultimately increases job engagement.

Along with job engagement improvement, each team member actively volunteered to conduct a study
related to the constraints of work and its solution alternatives. Each team member then performs a job crafting if it is found that must be adjusted to the work, cognitive or relational that has been experienced. This process is performed daily. So that work performance can be increased and achieved well.

**CONCLUSION**

Team job crafting is proven may increase the job engagement of staff. Regarding the results, this method must be implemented widely across all units and departments in the hospital and may become the new trend in hospital management of human resource. Further research should be made in larger scale in order to make a firm conclusion of this intervention.

**Ethical Approval:** Related departments should be assured about the confidentiality of the results of questionnaires

**Conflict of Interest:** The authors report no conflict of interest.

**Source of Funding:** Self

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Awareness about the Management of Avulsed Tooth among Medical Interns in Mangalore, India

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ABSTRACT

Aim & Objectives: Early management of the avulsed tooth is the key factor for the better prognosis, their knowledge of management of avulsed tooth is important. Hence the present study was conducted to evaluate the awareness among the medical interns regarding management of avulsed tooth.

Materials and Method: The study was conducted among three medical colleges in Mangalore city, Dakshina Kannada, Karnataka. The study design was of cross-sectional type and descriptive. The questionnaire regarding awareness about the management of Avulsed tooth were given to medical interns from the three medical colleges in Mangalore city.

Results: 300 medical interns participated in the study. It was concluded that majority of the medical interns, their knowledge regarding emergency management of dental trauma was poor. Therefore, orientation to manage the avulsed teeth should be part of the medical training education.

Conclusion: The present study stresses on necessity of recommending, that medical interns and physicians in hospitals’ emergency rooms should be made aware of their possible role in cases of avulsion of permanent teeth, in order to minimize the late complications associated with such injuries. One possible way to achieve this goal is through education during and after training and introduction of a formal protocol for treatment of avulsed permanent teeth and other dental injuries.

Keywords: Avulsion, medical interns, traumatic injuries

INTRODUCTION

Most of the dental trauma occurs in adolescents due to playground accidents, domestic violence, bicycle and motor vehicle accidents and sports injuries. These traumatic injuries may create significant impact on the quality of life since it causes both physical and psychological trauma. These dental injuries may result in intrusion, extrusion, avulsion, luxation, subluxation and fracture of the tooth. Among all these dental injuries tooth avulsion comprises 0.5%–16% and 7%–13% in the permanent dentition and in the primary dentition respectively.¹, ², ³, ⁴

Tooth avulsion is the complete displacement of a tooth from its socket in alveolar bone owing to trauma. Tooth avulsion results in separation of the tooth from the dentoalveolar socket and tearing of the periodontal ligament, leaving viable periodontal ligament (PDL) cells on the root surface.⁵ If the PDL attachment does not dehydrate, the cells will not undergo severe inflammatory response and allow replantation therefore it is imperative to keep these cells hydrated so that these cells remain

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vital and reattach to bone on replantation. The storage media required to maintain the viability of the cells are Hank’s balanced salt solution, milk, saliva, vestibule of the mouth or container with the patient’s saliva, normal saline or water in the order of preference. Earlier the avulsed tooth is replanted into the alveolar socket, favorable will be the outcome. Therefore every effort should be made to replant the tooth within the first 15-30 minutes.

During internship medical interns are posted to health centers where they have to handle emergencies independently. As early management of the avulsed tooth is the key factor for the better prognosis, their knowledge on management of avulsed tooth is important. Hence the present study was planned to evaluate the awareness among the medical interns regarding management of avulsed tooth.

**AIM**

Awareness on the management of avulsed tooth among medical interns of medical colleges in Mangalore city, India

**MATERIALS AND METHOD**

The cross-sectional study was conducted among the medical interns of 3 medical colleges in Mangalore city after obtaining the ethical clearance from the Institutional Ethics and research committee. Informed consent was obtained from all the participants and strict confidentiality was assured to the participants and maintained throughout the study process. The total sample size was 300 interns (male=126, female=174) which represented all mentioned 3 medical colleges. A validated questionnaire was used which consisted of 9 close ended questions, divided into two parts. The first part included questions on demographic data including gender, age. The second part consisted of 9 questions to assess the knowledge and attitude of medical interns on management of avulsed tooth. Data collected from the questionnaire were coded and analyzed using SPSS 14.0 and distribution of the variables were given in frequencies and percentages to evaluate the knowledge related to avulsion management among the medical interns. Description of variables- The marking scheme was tabulated. 1 mark was given for a correct answer, 0 for “Do not know/Not sure”. There were multiple answers for Question 8 so 1 mark was given to any of the correct answers chosen.

**RESULTS**

Three hundred Medical interns who consented to participate were distributed with the questionnaires. The completed questionnaires were collected back on the same day. Results showed that only 8% of the participants had come across with tooth avulsion. (Fig.1) 70% of the participants had an opinion that avulsion to be considered as an emergency. (Fig.1) 26% of the participants do not know about what to recommend to the parents of the children with avulsed tooth on contact. Around 56% of the participants would suggest the parents to collect the tooth and wrap in a clean of gauze piece / handkerchief. Small percentage would recommend to place the avulsed tooth in milk and in the mouth and seek dentist’s consultation. (Fig.1) 82% of the participants expressed that they would not replace the avulsed tooth back into socket and only 18% of participants expressed that they would replace the avulsed tooth back into socket (Fig. 1). Among those who would replace the tooth into socket, 77% felt the need to wash it with normal saline before placing into the socket and 23% would not. (Fig.2) Among the participants who expressed that they would not replace the avulsed tooth back into socket, 53% would wrap it with gauze, the rest would place it in ice (20%), container(25%) or in vestibule(2%). (Fig.2)

Majority of the participants preferred normal saline (49%) followed by milk(23%), HBSS(20%), water(6%) and last preference was saliva(2%), as transport medium to transfer the avulsed tooth. (Fig.2) .Only 14% of the participants felt that avulsed tooth replantation should be carried out within 15mins of avulsion time, while majority were not known with fact of replacement time. (Fig 2)
DISCUSSION

Since medical professionals handle dental traumatic injuries along with other injuries in any accident cases or road traffic accident, in any hospital or primary health centers before the dental professional, there is dire need of knowledge and skill to handle dental injuries by medical professional in emergency situation. In the present study only 8% of the participants who belong to medical profession have experienced tooth avulsion in contrary to previous study reported that almost 75% of the subjects had experienced at least one event of trauma. Since participants were interns in the future they may have to handle many dental injuries as a part of medical injury. Hence the present study was planned...
to evaluate the knowledge of dental avulsion amongst them at baseline. Most of them (70%) were aware that dental avulsion is an emergency but they had lack of knowledge to manage the cases. Around 56% of the participants would prefer to send them to dentist instead of handling the case and only 4% knew that they have to replace back tooth into the socket. Previous study by Diaz et al. reported that almost 25% of the subjects did not identify appropriate clinical procedure prior to replantation. None of the participants had the knowledge regarding the method of transporting the avulsed tooth while referring to the dentist. When given a choice 56% of participants felt normal saline is best medium for the transport of avulsed tooth. Previous study by Sae Lim et al. reported that 13.2% of the subjects answered that best transport media was saliva. 40% said that they would prefer milk as storage media. Another study reported that milk was the most preferred storage media. Around 46% of participants had no knowledge about replantation time of the avulsed tooth. Only 14% of the participants had knowledge regarding the time lapse of replacement. According to many previous studies there is not much of awareness regarding the immediate replantation of avulsed tooth among medical professionals. A recent study reported that only 4% of the physicians thought that replantation of avulsed tooth is possible. Another study reported that 2.9% of the subjects had preferred replantation. Diaz et al. reported that 43.9% would not replant for perceived high risk of infection. The previous study reported that, only 10% of subjects were in favor of immediate replantation of avulsed teeth and among the nondentist, it was 4.6%. Another study reported that almost 50% of the subjects were not in favor of replantation of avulsed tooth. Numerous previous studies reported that participants never received the information on management of dental trauma especially concerning dental avulsion during undergraduate days. Dental injuries usually tend to be neglected by the non-dental professionals. Hence, it is very crucial for the medical graduates to have fundamental knowledge regarding dental trauma management.

The findings of this study indicate that there is less awareness regarding emergency management of dental trauma among medical graduates of Mangalore city. This is detrimental for the prognosis of traumatized teeth. Hence, it is recommended to include management of dental emergencies in medical curriculum or to make the dentist to be a part of the emergency team.

CONCLUSION

The findings of the present study indicate that the awareness of emergency immediate dental trauma management is low. It is also observed that few of the measures preferred by the medical graduates for the management of traumatic injuries were detrimental to dental health. With a basic knowledge of the factors affecting the prognosis of traumatized tooth, the medical professional would be able to significantly contribute to successful treatment of the tooth. Thus, there is an urgent need to include the basics aspects of dental traumatology as a part of medical curriculum.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Institutional Ethics Committee, Manipal College of Dental Sciences, (Manipal Academy Higher Education), Reference No14038

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A Comparative Evaluation of Stress Distribution between Conventional and Platform Switched Implant Supported Crown in Different Densities of Bone: A Three Dimensional Finite Element Analysis

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ABSTRACT

Purpose: To analyze and compare the stress distribution in 3D FEA models of Implant supported mandibular crown in different densities of bone with platform switched abutment and another with a conventional matching diameter abutment.

Material and Method: Eight finite element models of different densities of bone with conventional and platform switched implants were prepared and subjected to axial and oblique loading. Average von Mises stress values were evaluated quantitatively and qualitatively.

Results: Maximum stress for the cortical bone were noticed in the D4 bone followed by D3, D2 and D1 bone. There was no significant difference between the stress values of cortical bone and cancellous bone

Conclusion: Within limitation of this study greater stress was generated in cortical bone and in implant abutment complex in platform switched implants

Keywords: platform switching, implant, density

INTRODUCTION

Development of an ideal substitute for missing teeth has been one of the long-term aims of dentistry. Introduction of osseointegrated implants has conveyed a new era of oral rehabilitation for both the completely and partially edentulous patients.

Even though the success rate of implants have been very high, implant failure do occur. The peri-implant bone level has been used as one of the criteria to assess the success of dental implants. Bone loss usually begins at the crestal area of the cortical bone and can progress toward the apical region, jeopardizing the health of the implant itself, as well as the supported prosthesis. The causes of marginal bone loss are complex, with a combination of mechanical and biologic factors contributing to crestal bone loss. It includes a traumatic surgical technique, loading conditions in relation to the quality and quantity of the surrounding bone, the location, shape, and size of the implant abutment microgap and its microbial contamination, the biologic width and soft tissue considerations, a peri-implant inflammatory infiltrate, micromovements of the implant and prosthetic components, repeated screwing and unscrewing, the
implant-neck geometry and the infectious process\textsuperscript{4,7}.

Over the years, attempts have been made to reduce or prevent marginal bone loss through modification of the implant-abutment connection\textsuperscript{6}. It has been reported that platform switching seems to reduce or eliminate the expected post restoration crestal bone remodeling\textsuperscript{5}. Platform switching concept explains the use of a smaller-diameter abutment on a larger-diameter implant collar. This connection shifts the perimeter of the implant-abutment junction (IAJ) inward toward the central axis (i.e. the middle) of the implant.

Finite element analysis (FEA) has become an increasingly useful tool for the prediction of the effects of stress in the contact area of the implants with cortical bone and around the apex of the implants in trabecular bone\textsuperscript{7}.

This study aims at to analyze and compare the stress distribution in 3D FEA models of Implant supported mandibular crown in different densities of bone with platform switched abutment and another with a conventional matching diameter abutment.

**MATERIAL AND METHOD**

Following approval from the Institutional ethical committee of the Manipal college of dental sciences, Mangalore the study was conducted in the Department of Aeronautical and automobile engineering, M.I.T, Manipal.

**Armamentarium:-**

CT scan of edentulous mandible. (Department of Oral medicine and Radiology), MCODS, Mangalore.

Tapered threaded internal hex implant (4.2 x 10mm) MIS Implant Technologies Limited, ISRAEL.

Standard abutment - 4.2mm; MIS Implant Technologies Limited, ISRAEL.

Platform switched abutment - 3.75mm; MIS Implant Technologies Limited, ISRAEL.

Metzer the Profile Projector (METZ- 801).

ANSYS – 11.0 Workbench Software.

Nickel –chromium alloy. (Wirolloy NB Bego, Germany).

Feldspatic porcelain. (VITA VMK Master, Germany)

The implant & abutment that were evaluated were as follows:-

**Model A:** - Tapered threaded internal hex implant (MIS Implant Technologies Limited, ISRAEL.) with conventional abutment.

Length=10 mm.

Diameter=4.2mm.

Abutment- 4.2mm.

Four models were representative of this group in different densities of bone i.e. D1, D2, D3, D4

**MODEL - B:** - A Tapered threaded internal hex implant (MIS Implant Technologies Limited, ISRAEL) with platform switched abutment.

Implant Length - 10mm.

Implant Diameter - 4.2 mm.

Abutment diameter - 3.75mm.

Four models represented this group.

An axial and an oblique load (30 degrees in relation to the longitudinal axis of the implant, from lingual to buccal) of 150N was applied on occlusal surface of the prosthetic crown was applied to simulate the masticatory loading. The loading was performed on a personal computer using ANSYS software 11.0. The von Mises stresses were used as the key indicators to analyse the stress levels and to evaluate the stress distribution in the prosthesis, abutment, implant, and peri implant area as this stress value summarize the overall stress rate at a point in the finite element model.

**RESULTS**

The von Mises stress (equivalent stress) values were only considered as they summarize the effect of all the six stress components with a unique value. The maximum von Mises stress were calculated in the model A and model B under axial and oblique loading in the prosthesis, abutment, implant and the peri implant tissue in different densities of bone i.e. D1, D2, D3 and D4. The magnitude of the stress in the two models is depicted in the Table 1 and 2.
When the peri implant bone tissue was analyzed cortical bone exhibited higher stress than the cancellous bone in all models and both the loading situations. Under oblique loading, higher intensity and greater distribution of stress were observed versus axial loading.

The results of the numerical analysis are shown in Table 1 and 2

For cortical bone, under the oblique loading the maximum von Mises stress were found in the D1 bone followed by D4, D3 and D2 bone density in both the models. The stress value of D1 was 1.5 times greater than D2 bone and 1.2 times greater than D3, D4 bone. The Model BD1 showed more stress than AD1 bone. In contrast to D1, it was noted that BD2, BD3, BD4 developed almost 1 Mpa lower stress than AD2, AD3 and AD4 bone. It was although not statistically significant but may influence later the clinical outcome.

Results for cortical bone in oblique loading implies that conventional abutment (Model A) will be more favorable in D1 bone and platform switched abutment (Model B) in D2, D3 and D4 bone in terms of stress reduction.

Under axial loading maximum von Mises stresses were found in D4 bone followed by D3, D2 and D1 bone in the Model A and B. It designates that the maximum stress values for the cortical bone increased with reduced bone quality in particular for D4 bone due to thin cortical layer inducing high stress concentration.

For cancellous bone the maximum von Mises stress were found in the D3 and D4 bone , with minimum stress values in the D2 bone respectively. The stress values were almost similar for BD3, BD4 and AD3, AD4 bone models under both the loading conditions. The equivalent stress for BD2 was higher than the AD2.

**Stress distribution in implant**

When the stress distribution at the implant was compared for both the models, it was apparent that Model B exhibited lesser stress concentration than Model A in all the densities of bone under axial as well as oblique loading condition. The stress was located at the implant neck and also on the outer edge of prosthetic platform at cortical bone level.

In implant the maximum von Mises stress were found in the oblique loading situation especially in D1 bone followed by D2, D3 and D4 bone respectively. The von Mises stresses were less in the model B, with stress reduction of 11% in BD1, 23% in BD2, 27% in BD3 AND 26% in BD4 as compared to AD1, AD2, AD3 and AD4 bone models.

Under axial load the model B showed low stress values in the implant as compared to the model A. The amount of stress reduction was 37.2% in BD1, 18% in BD2,13% in BD3 and 5% in BD4.

**Stress distribution in the abutment :-**

For both the models, under axial loading the stress in the abutment was found to be located in the most coronal and medial portion of the abutment. Under oblique loading, regardless of the model the stress appeared in the well delineated area that extend from middle to the apical portion of the abutment. The maximum von Mises stresses in the abutment were seen under oblique loading in the D1 bone, followed by D3 and D4 bone. Minimum stress in abutment was noted in the D2 bone.

Von Mises stresses in the abutment of Model B (platform switched) were lower than those seen in the abutment of Model A (conventional model) for both the loading conditions. The reduction of stress in the abutment with Model B versus Model A was 19.6% for BD1, 20.5% for BD2, 15.5% for BD3, 16.1% for BD4 bone.

Under the axial loading also there was a reduction in the von Mises stress values of the abutment in all the densities of bone for the model B. The stress values were decreased by 25% in BD1, 32% in BD2, 35% in BD3 and BD4.

**Stress distribution in prosthesis:**

In the prosthesis, maximum von Mises stress were located at the point of load application on the occlusal surface in both the models under both loading conditions. Comparing the von Mises stress in the different densities of bone the Model B shows greater values of stress than Model A.

The maximum stress values were seen with oblique loading in D2 bone, followed by D1, D3 and D4 bone. The increase in the stress values in the prosthesis for model B was 55% in D2, 38% in D1 bone and 36% in D3 and D4 bone respectively.
Under axial load the model A exhibited almost similar values in AD1, AD2, AD3 and AD4 bone model prosthesis. In the model B maximum von Mises stresses were seen in BD1 and BD2 with minimum stress values in the BD3 and BD4. But all the stress values were greater in the model B as compared to the Model A. The extent of stress intensification in the model B was 58% in BD1 and BD2. 50% in the BD3 and BD4.

It implies that Model B shifts the stress from bone implant complex towards the prosthesis. This shift of stress was more pronounced with in D2 and D1 followed by D3 and D4 bone quality.

Table 1. Maximum von mises stress in different components of Model A in different bone qualities and loading angles

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<thead>
<tr>
<th>Maximum von mises stress (Mpa) in different components of MODEL A in different bone qualities and different loading angles.</th>
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<td>MODEL A</td>
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Table 2. Maximum von mises stress in different components of Model A in different bone qualities and loading angles

<table>
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<th>Maximum von mises stress (Mpa) in different components of MODEL B in different bone qualities and different loading angles.</th>
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<td>MODEL B</td>
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DISCUSSION

The results of this study, revealed that in the cortical bone, D4 bone density exhibited the highest value of stress followed by D3, D2 and D1 bone for axial loading in both the models. But there was no significant difference between stress values of the cortical bone for the model A and B. The results were consistent with studies done by Pessoa et al who concluded that the reduction in abutment diameter presented a minimum effect on cortical bone junction. Also Pellizer et al in (2012) through 3D FEA, concluded that the platform switching and conventional abutment exhibited similar stress intensity.

Comparing the stress values in different densities of bone, the maximum stress under axial load was found in the D4 followed by D3, D2, D1. This finding is in agreement with studies done by Sevimay et al and Almedia et al which displayed an increase in the stress values as the bone density decreases. Sevimay et al (2005) investigated the four bone qualities for stress concentrations in an implant-supported crown and found that stress magnitudes were greatest for D3 and D4 bone. Also Almedia et al (2010) has found the similar results in their 3D FEA for the Edentulous mandibles with different bone types supporting multiple-implant superstructures. But in oblique loading the maximum stress was located in D1 bone quality followed by D4, D3 and D2 bone for both the models.

When the values were compared in all the qualities of bone for model A and B under both the loading situation, axial load showed highest stress values in the prosthesis and the abutment followed by implant for both the models.

A possible reason for the lower stress in the prosthesis abutment complex of Model A may be greater diameter of abutment which distribute the loads better as a result of increased contact area between abutment and implant.

Considering the loads, the oblique component revealed higher stress in all the components for the both the models as it was also demonstrated by other studies done by H S chang et al(2013) that reported the highest stress concentration with lateral loads.

Thus present study implies that, dental implants with a platform-switched abutment expressed better stress distributions than conventional abutment in cortical bone, implant and abutment under axial as well as oblique loading for all the densities of bone. To achieve favorable success rates or survival rates of dental implant treatment, careful selection of the implant abutment connection combined with ideal bone quality and a proper loading protocol are strongly suggested to minimize the destructive influence of loading forces on the surrounding bone of a dental implant.

CONCLUSION

1. Under axial loading for the model A (conventional model) the maximum vonmises stress for the cortical bone were noticed in the D4 bone followed by D3, D2 and D1 bone. Among the different components of the model A the maximum stress concentration was showed by prosthesis and abutment in all the densities of bone.

2. There was no significant difference between the stress values of cortical bone and cancellous bone for the Model A and B under both the loading conditions.

3. Under oblique loading the model A showed maximum stress in D1 bone followed by D4, D3 and D2 bone. In all the densities of bone maximum stress absorption was seen in implant and the abutment for the model A among the different components of the model.

4. Under axial loading for the model B, the maximum vonmises stress for the cortical bone were noticed in the D4 bone followed by D3, D2 and D1 bone. Among the different components of the model B the maximum stress concentration was showed by prosthesis and abutment in all the densities of bone.

5. Under oblique loading the model b showed maximum stress in D1 bone followed by D4, D3 and D2 bone. In all the densities of bone maximum stress absorption was seen in abutment and the prosthesis for the model B among the different components of the model.

6. Under axial loading the amount of stress shifted in the abutment prosthesis complex was more in the Model B as compared to model A.

Conflict of Interest : Nil

Source of Funding : Self
REFERENCES


Activities of Daily Living and Instrumental Activities of Daily Living in Patients with Schizophrenia: A Scoping Review

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ABSTRACT

Introduction: The nature of research, as well as mental illness treatment, has been continuously evolving. Although various studies have focused on Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) difficulties in schizophrenia, no formal review has been established so far. This scoping review aims to identify existing occupational therapy literature related to ADL and IADL in people with schizophrenia.

Method: Comprehensive search of Web of Sciences, Scopus, PubMed/MEDLINE, CINAHL Plus full-text, ProQuest Health & Medical Complete, PsycINFO databases was carried out for peer-reviewed journal articles related to ADL and IADL among patients with schizophrenia. Data were extracted and analyzed using the descriptive analysis.

Conclusion: This study provided a broad overview of ADLs and IADLs done by patients with schizophrenia. The results of the current review will help identify gaps in the occupational therapy evidence related to practice in mental illnesses, especially in schizophrenia.

Keywords: Occupational therapy, schizophrenia, ADL, IADLs.

INTRODUCTION

Schizophrenia is “a clinical syndrome of variable but profoundly disruptive psychopathology that involves cognition, emotion, perception and other aspects of behavior” (¹). Patients with schizophrenia may have symptoms such as such as delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, negative symptoms and social/occupational dysfunction. Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) states that at least two or more of such symptoms should be present for a significant portion of time during a one-month period for a diagnosis of schizophrenia.

Occupational/social dysfunction is marked disturbance in one or more areas of functioning such as work, interpersonal relations, or self-care (²). The National Institute of Mental Health (NIMH, 2016), states that the prevalence rates for schizophrenia are approximately 1.1% of the global population over the age of 18.

Schizophrenia affects one’s occupations like self-care and social functioning (³). According to the American Occupational Therapy Association (n.d), the focus of occupational therapy is to support and enable each person’s “health and participation in life through engagement in occupation.” The World Federation of Occupational Therapists (WFOT, 2012) states that occupations involve actions people need, want and are expected to do; they are also activities that people engage in on an everyday basis as individuals, or in groups, to bring about meaning and purpose to life.

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Self-care activities, considered as activities of daily living (ADLs) in occupational therapy, are defined as activities concerned with taking care of one’s body (4). “Activities to support daily life within the home and community that often require more complex interactions than those used in ADLs” are defined as instrumental activities of daily living (IADL). ADL include bathing, toileting and toilet hygiene, dressing, swallowing/eating, feeding, functional mobility, personal device care, personal hygiene and grooming, and sexual activity. While IADL includes care of others, care of pets, child rearing, communication management, driving and community mobility, financial management, health management and maintenance, home establishment and management, meal preparation and clean-up, religious and spiritual activities and expression, safety and emergency maintenance and shopping (5). These activities are “fundamental to living in a social world as they enable basic survival and well-being” (6).

There are different studies associating schizophrenia with a deterioration in ADL or IADL (7, 8). A study (9) shows that living difficulties are between 2 and 12 times more common for people with schizophrenia than for people with other psychological disorders. One of the essential intervention goals in patients with schizophrenia is independence in ADL (10).

Although there have been developments in biological and psychosocial treatments, many people with schizophrenia are still considered to have problems in performing the roles and occupations for daily life. A study (11) proposed that occupational engagement is often viewed as living life more fully despite mental illness. Therefore research is required to measure this domain for effective interventions in schizophrenia (12). Through analysis, more effective interventions can be identified which will help improve the quality of care provided to clients (13).

Although various studies considered ADL and IADL difficulties in schizophrenia, there is lack of reviews in this area. With future demands of evidence-based practice, it is essential to review the research in this area. Therefore, in this scoping review, we analyzed research that is more relevant to current clinical settings and issues and compiled the studies focussing on ADL and IADL in people with schizophrenia.

Objective:

This scoping review identified existing occupational therapy literature related to ADLs and IADLs in people with schizophrenia which will further help to identify gaps in effective interventions.

Research Question: What is the available occupational therapy literature focusing on ADL and IADL among people with schizophrenia?

METHOD

This scoping review followed the following methodological framework (14).

Stage 1: Identifying the research questions:

Based on the literature review, research question was derived and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline were used to report the results of the review.

Inclusion criteria:

(a) All occupational therapy literature focussing on ADL and IADL in people with schizophrenia from January 2012 to December 2017, available in English was considered for this study.

(b) Articles related to all types of schizophrenia were included.

(c) Only studies those had at least one occupational therapist as the author were considered.

Exclusion criteria:

(a) Articles written by other professional but published in OT journals were excluded.

(b) Studies apart from free full-text online publications were also excluded.

Stage 2: Identifying relevant studies

Two researchers independently conducted a comprehensive and broad search of following electronic databases: Web of Sciences, Scopus, PubMed/ MEDLINE, CINAHL Plus full-text, ProQuest Health & Medical Complete, PsycINFO. Search terms included keywords developed from Medical Subject Headings (MeSH) and ‘ADL,’ ‘BADL,’ ‘IADL,’ ‘ADL retraining,’ ‘Schizophrenia,’ ‘Occupational Therapy,’ using Boolean operators such as AND, OR and NOT. References were
exported and duplicates removed using citation manager software.

**Stage 3: Study Selection**

Two independent researchers screened the titles, abstracts, and full articles. Potential relevant articles were screened for inclusion and exclusion criteria. Studies meeting the inclusion criteria were included. A third reviewer resolved any disagreement about the eligibility. The team had a regular meeting to assess the progress of scoping review.

**Stage 4: Charting the data**

Data charting form was developed and used to extract data from included documents. Two researchers independently collected the data and then further compared it. The data retrieved included: author and publication information, study objectives, methods, findings, and conclusion.

**Stage 5: Collating, summarising and reporting the results**

Data was analyzed and presented using descriptive summary analysis.

**RESULTS & DISCUSSION**

The online literature search revealed that in the past five years, there is insufficient occupational therapy literature focusing on ADL and IADL among people with schizophrenia. The systematic search of the electronic databases yielded 88 potential articles. Of these, we included only 17 studies in the review. The remaining 71 were excluded as the studies did not meet the selection criteria such as having an occupational therapist as one of the authors. Out of the 17 articles, there were three articles published in 2011, two in 2013, three in 2014, six in 2015, and three in 2016. We did not find any relevant study published in 2012. Table 1 depicts the detailed data extracted from the articles.

In 2011, one systematic review (15) was published that investigated the effectiveness of OT interventions for people with serious mental illness where the results showed the moderate efficacy of ADL and IADL training to improve performance. Two randomized control trials (16, 17) were conducted in 2011 and 2013 that discussed the influence of schizophrenia symptoms and cognitive abilities on IADL functioning and the effects of occupational therapy on patients with schizophrenia respectively. The former claimed that IADL that are required for efficiently surviving in the community are not typically performed in institutional care settings, while the latter concluded that occupational therapy combined with medications enables improvement of patient’s functioning.

There were three quasi-experimental studies done in 2011, 2014, and 2016. The first (18) was a comparison between occupational goal interventions to the frontal executive program. The study (19) from 2014 focused on occupational therapy and functional independence in people with schizophrenia, and the study showed improved functional independence measure scores after OT intervention. The study (20) from 2016 discussed individual occupational therapy intervention in comparison to group intervention and yielded results that the addition of individual intervention to group occupational therapy intervention improved cognitive functioning of people with schizophrenia significantly.

Two semi-structured qualitative studies (21, 22) were focused on mental illness and loss of occupation, where the study results explain that patients with mental illness experienced occupational loss. The later study (23) discussed the attitude of patients with schizophrenia towards occupational therapy and life satisfaction, where results yielded that 85% of the study population believed occupational therapy was beneficial.

In 2014, a narrative review (24) was published on the overview on occupations or activity based groups described in occupational therapy, and the literature showed that more evidence was required and that activity-based group interventions provided to young people with mental health difficulties may enhance their health.

Two retrospective studies were done in 2013 and 2015. The study (12) from 2013 explored the relationship between cognition and functional independence, and the literature showed that more evidence was required and that activity-based group interventions provided to young people with mental health difficulties may enhance their health.

In 2015, a study (11) evaluated ADL’S with Assessment of Motor & Process Skills (AMPS) in people with schizophrenia, where the results concluded that
AMPS was beneficial, but more useful in conjunction with other functional assessment tools.

Four cross sectional studies \((11, 25, 26, 27)\) were identified from the databases, out of which, three were done in 2015 while one was published in 2016. In 2015, one study \((25)\) explored assessment practices of occupational therapists and came to the conclusion that non standardized interviews and observations were commonly used, and COPM and AMPS were the frequently used standardized assessment tools. The study also found that no assessments were done after the initial period. Another study claimed that occupational engagement promoted empowerment. The third study \((26)\) from 2015 that explored the factors influencing occupational engagement in people with mental illness and concluded that occupational engagement helps live meaningful life despite illness. This was supported by a study \((27)\) in 2016 as it claimed that people with schizophrenia benefitted from doing occupations.

Although data shows that a systematic review has been established; as previously explained in need of this study, no formal review has been published that focuses exclusively on ADL and IADL in people with schizophrenia. Similarly, there has been only one retrospective study that focuses on difficulties in IADLs and ADLs in people with schizophrenia, but there has been no study that explains effective interventions for the same. In this literature review, no defined trends were evident. Granting that there are articles that support occupational therapy interventions’ role in the significant improvement of functioning in people with mental illness \((12, 18, 20, 27)\) from the analysis, it is clear that more research is required within this domain.

**IMPLICATIONS OF THE STUDY**

This scoping review may aid as a guide for available occupational therapy literature in the areas of ADLs, IADLs, and schizophrenia. Moreover, examination of studies involving the services of occupational therapy in mental health practice may serve as an essential reference for occupational therapists and give evidence to practice when discussing the services provided and to other health professionals, lawmakers and insurers, to understand how occupational therapy services help treat clients with mental illness. Additionally, this scoping review may also serve as the groundwork for future studies with regards to ADLs and IADLs in people with schizophrenia.

**CONCLUSION**

Review of articles revealed that there is a lack of evidence in domains of ADL and IADL intervention for people with schizophrenia, even though occupational therapy has its origins in mental health. More evidence-based studies are required to support OT interventions to help improve the quality of life in people with schizophrenia.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

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Comparison of Tear Film Characteristics between *Kajal* (Kohl) Users and Non-Users

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ABSTRACT

**Aim:** To determine the effect of applying *Kajal* (an eye cosmetic) over the eye lids on tear film stability and quantity.

**Methods:** Non-invasive tear break-up time and Schirmer test were performed on 46 female subjects (23 *Kajal* users and 23 non-*Kajal* users). All measurements were performed in the morning.

**Results:** Quantity of the tear film was not altered with *Kajal* use but the stability of tear film was significantly lower in the *Kajal* wearing group (p<0.001).

**Conclusion:** Present study demonstrates that application of *Kajal* as cosmetic over the eye lid margins can reduce the tear film stability.

**Keywords:** *Kajal*, Non-invasive tear break-up time, Schirmer test.

INTRODUCTION

Application of *Kajal* (Kohl or suruma) as an eye cosmetic is a popular practice among women in South Asia, Middle East and Africa. The use of *Kajal* has been reported since antiquity and is worn for a variety of reasons including religious beliefs, tradition, medicinal benefits; but importantly as a cosmetic. *Kajal* may be defined as an eye preparation in ultra-fine form of specially processed “kohl stone” (galena) incorporated with other therapeutically active ingredients from marine, mineral and herbal origin and is applied along the upper and lower eye lid margins.¹,²

Stable tear film over the cornea is very important to maintain a uniform refracting surface and for comfort in the eye.³ Usage of eye cosmetics is known to cause disturbances in the stability of tear film and cause dry eye symptoms.⁴ Application of *Kajal* over the eye lid margin blocks Meibomian gland orifices and can potentially affect the lipid layer of tear film which in turn may affect the tear film stability.² This study was done to determine the effect of applying *Kajal* along the eye lid margins on the tear film quantity and stability.

SUBJECTS AND METHOD

Forty-six young, healthy female students (23 *Kajal* wearers) with their age ranging from 18-25 yrs were recruited for the study. To determine the sample size, a pilot study was conducted on 10 subjects and based on the observations it was estimated that each group should have a minimum of 21 participants. Subjects having any ocular pathology, eye lid abnormalities, contact lens wear, usage of any type of systemic medications, smokers and those who used computers for more than 6 hrs a day were excluded from the study. All participants signed a written informed consent before they were enrolled. An approval from the institutional review board was obtained prior to the conduct of the study.

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Subjects who used Kajal for at least 5 days a week on upper and lower eye lid margins and had been applying it 6 months or more were defined as Kajal users. Since application of fluorescein to measure break-up time (BUT) was known to alter the interaction between the tear layers; a more clinically reliable option of non-invasive tear break-up time (NIBUT) was chosen to assess the tear stability. NIBUT was performed with a Bausch & Lomb model Keratometer (KMS 6; Appasamy, Chennai, India) which involves observation of a reflected keratometric mire image from the anterior tear surface. At the time of measurement, subjects were instructed to blink completely for 3 times and then asked to refrain blinking. The time (in seconds) between the last blink and a break or discontinuity in the appearance of keratometric mire reflection on the cornea was taken as break-up time. This procedure was repeated thrice and average was taken.

Tear quantity was measured using Schirmer test-II after instilling topical anaesthetic (Proparacaine Hydrochloride 0.5%, Sunways (I) Pvt.Ltd, Mumbai, India) eye drops to avoid reflex tearing. All Schirmer tests were performed using sterile paper strips (BIO SCHIRMER; Biotech Vision Care, Gujarat, India) that were pre-packaged. Subjects were made to sit comfortably on a chair and asked to look left and up. Strips were placed at the lower conjunctival cul-de sac hooked over the lateral 1/3rd of the lower eyelid margin and subjects were asked to keep the eyes closed. Strips were removed after 5 minutes and measured the length of wetting.

Both measurements were done only for right eye at room temperature between 9:00am – 10:0am. NIBUT was performed as the first test and a gap of ten minutes was provided before Schirmer test. Data were analyzed using SPSS v.16. Normality of the data was confirmed using Kolmogorov – Smirnov test and Independent t-test was performed to compare the mean tear film values between the groups. A p value of <0.05 was considered statistically significant.

RESULTS

Mean age of the participants was 19.9±1.8 years (Kajal users 19.7±1.9 yrs; non-Kajal users 20.0±1.7 yrs). Kajal wearers applied that for cosmetic purposes and the mean duration of use was 5.1±1.4 yrs (range 2 yrs to 8 yrs). The results of all tear film measurements are summarized in table – 1.

All the variables shown in the table followed normal distribution (Kolmogorov-Smirnov test p>0.05). Independent sample t-test was performed to find out whether the differences observed in the tear film characteristics between the groups were significant or not. The Schirmer test demonstrated higher values in the Non-Kajal wearers; however, the difference was not statistically significant (p=0.984). But, the NIBUT measurements done on Non-Kajal users showed a significantly higher value compared to the other group (p<0.0001).

Table-1: Tear film parameters measured in Kajal users and non-kajal users

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIBUT – with Kajal (sec)</td>
<td>6.98</td>
<td>1.33</td>
<td>10.60</td>
<td>5.20</td>
<td>6.70</td>
</tr>
<tr>
<td>NIBUT – without Kajal (sec)</td>
<td>9.56</td>
<td>1.66</td>
<td>12.80</td>
<td>6.35</td>
<td>9.20</td>
</tr>
<tr>
<td>Schirmer Test – with Kajal (mm)</td>
<td>20.44</td>
<td>8.84</td>
<td>35.00</td>
<td>7.00</td>
<td>21.00</td>
</tr>
<tr>
<td>Schirmer Test – without Kajal (mm)</td>
<td>20.50</td>
<td>9.08</td>
<td>35.00</td>
<td>9.00</td>
<td>19.00</td>
</tr>
</tbody>
</table>

DISCUSSION

A relatively thinner tear lipid layer secreted by tarsal Meibomian glands spread over the ocular surface by blinking mechanism protects the tear film from evaporation. Disturbances to the tear film lipid layer like thinning and non-uniformity is known to affect tear film stability. Use of ocular lubricants, cosmetics and contact lenses are among the factors that are known to decrease the stability of tear film.

Application of eye cosmetics results a continuous presence of its minute particles in the tear film. Goto et al demonstrated that the area on the eyelid where the
cosmetics are applied has an important role in the rate of migration of these particles to the tear film. Cosmetic material applied at the inner eyelash line group showed a higher migration and contamination rate compared to the eyelash line and outer eyelash line group. This contamination in turn causes a faster destruction of lipid layer and reduces the capability of lipid to spread.

The effect of cosmetic use on tear film is also depends upon the nature of its ingredients and the skill and the area where it is applied. Cosmetics applied over the margin of eyelids results a direct obstruction to the Meibomian gland orifices and contaminates its secretion. Moreover, it also leaves significant amount of debris on the superficial lipid layer.

Kajal is usually applied along the lid margins which causes the cosmetic particles to spread over the Meibomian gland openings. In this study, the NIBUT measurements performed on subjects who were applying Kajal showed a significantly lesser value compared to the group which was not using the cosmetic. The contamination of tear film and blocking of Meibomian gland openings due to the spread of cosmetic materials over the lid margin would have affected the tear film stability. Previous studies demonstrates that eye makeups are shown to cause dry eye symptoms. Findings of the this study has a clinical importance since majority of contact lens users worldwide are females. Hence it is suggested to consider this while instructing the contact lens users if they are using eye cosmetics and especially if they apply it on eye lids. On the other hand, quantity of tear film measured using Schirmer test – II has not shown any difference between the groups.

However, due to the tendency of high variability of tear film tests, these results should be validated on different set of subjects and settings. The impact of eye lid cosmetics on tear stability can also be confirmed by repeating the same measurements after stopping the cosmetic usage for a while in people who use eye lid cosmetics. A comparison of subjective ocular symptoms between Kajal wearing and non-wearing groups would also help us to understand the subjective effect of using eye lid cosmetics.

In this study, we examined the tear film clinical characteristics on two groups of subjects; those who used Kajal as an eye cosmetic and those who did not. The results demonstrate that mean non-invasive tear break-up time (NIBUT) among Kajal wearers were significantly lower than those who did not apply it.

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Conflicting Interest (If present, give more details): Nil

REFERENCES
Empirical Evidences for Effectiveness of Employee Participation in IT Companies

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ABSTRACT

Employee participation is a special form of delegation in which the subordinates gain greater control, freedom of choice with respect to bridging the communication gap between the management and workers. The purpose of this paper is to empirically explore the evidences of employee participation in IT companies. This paper adopts the qualitative and quantitative methodology. Data were collected from top 5 IT companies and Statistical tools like KMO & Bartlett’s test, Chi square test, One way variance and Linear multiple regression analysis were used to analyze the data in systematic order. The findings of this study indicates that there are 5 predominant factors namely job involvement, job design, performance appraisal, interpersonal relationship and executive development increases the efficacy of employee participation in IT companies.

Keywords: Employee participation, IT companies, Employee perceptions, Contributions, Involvement, Productivity.

EMLOYEE PARTICIPATION

Participative supervision is a device that is used to stimulate the workforce. When subordinates are concerned in management at all levels it is known as involvement. Contribution is the cerebral and exciting connection of inhabitants in collective situation that encourage them to donate to faction goal and distribute liability for them.

Employee participation is a primary model in the endeavor to recognize and explain both qualitatively and quantitatively the life of the rapport between a business and its employees. An occupied worker is defined as one who is entirely immersed by and passionate about their work and so takes helpful action to further the organization’s status and welfare. An engage employee has a positive approach towards the business and its ethics. An organization with elevated employee engagement may therefore be expected to do better than those with low employee engagement.

EFFECTS OF EMPLOYEE PARTICIPATION

Employee contribution will create effects in employee’s job fulfillment, employee efficiency, employee obligation and they all can produce relative benefit for the organization. Growing employee involvement will have an optimistic outcome on employee’s job satisfaction, employee assurance and employee efficiency. Naturally rising employee participation is an enduring process, which demands both awareness from executive side and plan from the employee side. The level of employee participation amplifies the organization’s intended planning activities.

Employee participation is a unique form of entrustment in which the subordinate achieve greater control, liberty of option with high opinion to bridge the communication break between the administration and employees. The employee contribution in the preparation process leads to prospective improvement, which may facilitate chance and appreciation in the organization. It amplifies employee’s self-respect and develops the invention. It grant employees the chance to use their intellectual which will direct them to better decisions for the organization Employee involvement contribute to faith and good judgment of control.

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BENEFITS OF EMPLOYEE PARTICIPATION IN ORGANIZATION

The benefits of employee participation are apparent, and well-worth the effort. They include constructing society, better contact, fewer tension, larger yield, and superior product worth. If workers believe that their view is valued it will enhance their excellence of labor atmosphere which lead the company by the expansion of a worker population. Employees will have a concrete possibility for communicating their feelings direct to new inventive ideas. Involvement of employees in all fields in the business, lead with a reduction of pressure, better-off work milieu, emotion respected and dedicated towards the work. If the employee’s suggestions are taken into deliberation new workflows will be implementing more rapidly to raise product output.

LITERATURE REVIEW

Gary J. Castrogiovanni, Barry A. Macy, 1990, on his empirical study found that intensified worker participation results in amplified information-processing capacity. The study proved that participation is an expedient strategy for developing the data processing requirement abilities in the level of outcomes of organizational efficacy.

Susan Schwochau, John Delaney, Paul Jarley, Jack Fiorito, 1997, through their study, identified that involvement program are certainly connected with the evaluation of employees, earning sharing, plan construction, employee judgment, aptitude, proficiency and acquaintance leads to organizational performance.

Gyan-Baffour George, 1999, in an innovative study, found that business has advanced flexible job design than the routine of the employee will also be in higher level. On analysis, it was found that some factor are most important to conquer elevated level of routine they are forecast position, know-how education, impact of equipment, job plan and job conversation.

Rhokeun Park, 2007, in an innovative study focused on different styles of employee participation in adoption of different task characteristics of employees. On analysis, it was found that sharing management information with employees leads to organizational commitment, which in turns integrates them to self-directed teams and group incentives.

Brent Kramer, 2008, through his study found out that shared capitalism has beneficial effects on all outcomes when combined with high performance work policies such as employee contribution, education and job safety. On analysis it was found that ownership and authority have synergistic effects on yield and promotion.

Edwinah Amah and Augustine Ahiauzu, 2013, in a co-relational study found that employee participation in certain process such as decision-making, ensuring the achievement of organizational goal, ownership and responsibility, job satisfaction behavior, maintaining culture, increase in profitability, productivity and market share leads to the overall effectiveness of the organization.

Steven H. Appelbaum, Damien Louis, Dmitry Makarenko, Jasleena Saluja, Olga Meleshko and Sevag Kulbashian, 2013, through his study identified that practicing process of decision-making utilizing staff in certified practice increases staff enthusiasm to take part in decision-making process. On study, it was found that involvement of staff in decision-making process increase the stage of job fulfillment and dedication of the staff towards the institute.

B. Swathi, D. Raghunadha Reddy, V. Venkat Reddy, April 2014, through their study investigated the effects of employee contribution and employee development in public and private sector organizations. On analysis, it was found that understanding employees in suggestion, ideas, recommendations, acknowledgement and responding to matters, make them feel that they are recognized by the organization, which leads to employee involvement and employee culture.

Eva Kyndt, Patrick Onghena, Kelly Smet, Filip Dochy, 2014, through their investigated the acquiescence of employees in employment linked learning. It was found that some affirmative factor drive them towards development intention such as self-motivated in profession processes, time supervision, employability, organizational hold, development possibilities, former participation and preliminary level of edification.

Marie-France Waxin et al, 2018, It was found that there are six predominant factors more suitable for recruitment and selection of employees in any organizations namely lack of relevant education, skills and experience, expectation of high compensation, lack of career awareness, heavy competition in the industry, assigning job suitability and resistant from expatriates.
GAPS IN THE LITERATURE

After reviewing the above mentioned international reviews pertaining to employee participation the researcher identified to predominant gaps that still remains unanswered.

What are the factors that can ascertain the real participation of employees?

Is there any relationship between employee participation and benefits to the organization?

In order to ascertain these research gaps the researcher attempts in this direction to find the solution to the above mentioned research question.

OBJECTIVES OF THE STUDY

To determine the factors of employee participation.

To find the nature of relationship between employee participation and organizational benefits.

HYPOTHESIS

There is no relationship between employee participation and benefits to the organization.

METHODOLOGY

This research is completely based on the responses given by the IT company employees to a well structured questionnaire. It consists of three parts namely

1. Personal and organizational details of the employees.
2. Employees’ perceptions towards their participation in organizational activities.
3. Employee perception on organizational benefits.

The first part completely consists of optional type questions and the

Second and third are based on Likert’s five point scale which ranges from strongly agree to strongly disagree.

DATA COLLECTION

The researcher used convenience sampling method to collect the responses from top 517 companies. The researcher circulated 50 questionnaire each in these 5 companies and able to get 234 valid responses. Hence the sample size of research is 234.

DATA ANALYSIS

After obtaining the 234 responses they are systematically coded and numerically converted in the SPSS version 20 package. The following statistical tools are used to analyze the data.

1. KMO and Partlett’s test.
2. Chi square test
3. One way analysis of variance
4. Linear Multiple regression analysis.

ANALYSIS AND DISCUSSION

In this section the researcher intended to identify the factors of employee participation in IT companies. The researcher considered all the 20 variables of employee participation and applied exploratory factor analysis and obtained the following results.

TABLE: 1

<table>
<thead>
<tr>
<th>KMO and Bartlett’s Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
</tr>
<tr>
<td>Df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

From the above table it is found that the KMO value for sampling adequacy is 0.328 and Bartlett’s test of sphericity is with appropriate Chi Square value is 3467.081, P=0.000 are statistically significant at 5% level. This shows that all the 20 variables of employee participation are reduced into 9 predominant factors with cumulative variance of 78.356% that is clearly expressed in the table below.
TABLE: 2: Cumulative variance analysis

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>2</td>
<td>2.447</td>
<td>12.233</td>
</tr>
<tr>
<td>3</td>
<td>2.014</td>
<td>10.068</td>
</tr>
<tr>
<td>4</td>
<td>1.901</td>
<td>9.503</td>
</tr>
<tr>
<td>5</td>
<td>1.636</td>
<td>8.181</td>
</tr>
<tr>
<td>6</td>
<td>1.407</td>
<td>7.034</td>
</tr>
<tr>
<td>7</td>
<td>1.246</td>
<td>6.231</td>
</tr>
<tr>
<td>8</td>
<td>1.087</td>
<td>5.437</td>
</tr>
<tr>
<td>9</td>
<td>1.012</td>
<td>5.060</td>
</tr>
<tr>
<td>10</td>
<td>.952</td>
<td>4.759</td>
</tr>
<tr>
<td>11</td>
<td>.593</td>
<td>2.963</td>
</tr>
<tr>
<td>12</td>
<td>.419</td>
<td>2.095</td>
</tr>
<tr>
<td>13</td>
<td>.274</td>
<td>1.370</td>
</tr>
<tr>
<td>14</td>
<td>.149</td>
<td>.747</td>
</tr>
<tr>
<td>15</td>
<td>.062</td>
<td>.308</td>
</tr>
</tbody>
</table>

From the above table it is evident that the total cumulative variance is 78.356% and individual variances for the 9 factors range from 6.012% to 12.107%. This implies the 9 factors are job design, job assignment, job involvement, job satisfaction, job description, transparency, trust and openness, performance appraisal system and interpersonal relationship.

This is further validated by applying confirmatory factor analysis. In this analysis the underlined variables of each factor is validated with high variable loadings. In this analysis the researcher verifies the validity through the following fit indices as shown in the table below.

TABLE: 3: Confirmatory factor analysis

<table>
<thead>
<tr>
<th>Serial no</th>
<th>Fit indices</th>
<th>Values</th>
<th>Bench mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chi square</td>
<td>2.107</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>P value</td>
<td>0.341</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>3</td>
<td>Goodness of fit index</td>
<td>0.959</td>
<td>&gt; 0.9</td>
</tr>
<tr>
<td>4</td>
<td>Comparative fit index</td>
<td>0.962</td>
<td>&gt; 0.9</td>
</tr>
<tr>
<td>5</td>
<td>Nor med fit index</td>
<td>0.955</td>
<td>&gt; 0.9</td>
</tr>
<tr>
<td>6</td>
<td>Root mean square error of approximation</td>
<td>0.07</td>
<td>≤ 0.08</td>
</tr>
</tbody>
</table>
From the above table found that all the fit indices are satisfying the benchmark values. It shows that all the 9 factors job design, job assignment, job involvement, job satisfaction, job description, transparency, trust and openness, performance appraisal system and interpersonal derived by the researcher is validated with high reliability.

**FINDINGS AND CONCLUSIONS**

It is concluded from the research that in the IT companies employee participation depends upon the 5 pre dominant factors namely

1. Job involvement
2. Job design
3. Performance appraisal
4. Interpersonal relationship
5. Executive development

It is also further ascertained that the job involvement of employees increase the organizational productivity. Job design which is assigned to the employees is very important to verify their full participation to obtain the organizational benefits. A rationalized performance appraisal system motivates the employees to show their full participation for the organizational benefits. Smooth interpersonal relationship positively motivate the employees to dedicate their work to the development of the organization. Executive development programs in the IT companies directly help the organization to increase the productivity, individual efficiency and total change in the organization.

**Conflict of Interest** – Nil

**Ethical Clearance** – Taken from UGC Committee

**Source of Funding**- Self

**REFERENCES**

5. Appelbaum, Steven H; Louis, Damien; Makarenko, Dmitry; Saluja, Jasleen; Meleshko, Olga; Sevag Kulbhashian, “Participation in Decision-making; a Case study of Job Satisfaction and Commitment”, Industrial and Commercial Training, 2013.
Biosignal Processing Approaches for Detecting Mental Fatigue

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ABSTRACT

Mental fatigue is a typical phenomenon in our everyday life, and is characterized as a condition of cortical deactivation. Mental deactivation produces performance degradation such as human failures, errors and health problems, thereby detaining the quality of life. Various physiological parameters obtained from biosignals have been identified as an indicator of fatigue. The main biosignals that help to detect the mental performance are Electrocardiogram (ECG), Electroencephalogram (EEG) and Electrooculogram (EOG). After acquiring these signals, they undergo various stages of processing which includes signal de-noising, feature extraction and classification for the efficient analysis of mental performance. The paper provides comprehensive review of various approaches involved in processing of biosignals to detect mental fatigue.

Keywords – Mental Fatigue, Signal Processing, Electrocardiogram (ECG), Electroencephalogram (EEG), Electrooculogram (EOG).

INTRODUCTION

Across the world, 10% of the total population at any one time experiences the ill effects of steady tiredness or fatigue1. Fatigue is a kind of stress that prolongs over a period of time. Particularly, mental fatigue is a temporary inability to maintain optimal cognitive performance2. This fatigue is life undermining, particularly when the sufferer need to play out a few assignments, for example, driving a vehicle, working substantial hardware or playing out any cautiousness undertaking. The effects of mental fatigue are decreased alertness level, loss of finer motor control and reduction in efficiency to perform any task1. Therefore it is necessary to analyze the cognitive state of the person in advance so that immediate treatment can be provided to avoid catastrophic effects.

Basically there are two broad ways of detecting human fatigue: Vision based and Signal based. Visual practices that ordinarily mirror a person’s level of fatigue incorporate eyelid development, head development, look and facial appearance. Percentage of eyelid closure (PERCLOS)3 has been observed to be the most robust and substantial measure of an individual’s awareness level. Though vision based method is non-intrusive, it is not all that precise, extremely influenced by environmental backgrounds4. In signal based method, biosignals are acquired from individual using sensors, processed for removing the noise and then relevant features are extracted. This method is accurate but mostly intrusive.

In this paper, signal based method is applied for detecting mental fatigue and a comprehensive survey of various signal processing approaches adopted with biosignals like Electrocardiogram (ECG), Electroencephalogram (EEG) and Electrooculogram (EOG).
MATERIALS AND METHODS

Biosignal Processing Approaches

Often the goal of signal processing is to identify the presence of signal buried in noise, to separate out signal from noises and to detect the features of signal present in noise. ECG, EEG and EOG are the biosignals taken for analysis of mental performance level, as the researchers have found that the parameters of these signals show changes when there is a gradual decrease in cognitive task. Figure 1 shows the fundamental processes involved in signal processing approaches. In this paper, we wish to list down the major de-noising and feature extraction techniques applied for the efficient analysis of mental fatigue.

Figure 1. Block diagram of signal processing approach for detecting mental fatigue.

Denoising Techniques

The process of eliminating noise from a signal is referred as signal de-noising. Intuitive quality, compression, efficacy, accuracy of the signal and bandwidth reduction can be improved through de-noising. It is also very difficult to remove the noises using simple filtering operations which cannot remove noises completely as they may cause elimination of frequencies contributing to ECG features which causes distortion of signal.

Wavelet De-noising

The most widely used Wavelet Transform has the property of multi-resolution in a specific manner with variable window size. The de-noising methods based on Wavelet Transform provide quality and flexibility for the noise elimination from signals and image. Adaptive filter based on Wavelet Transform is the recommended approach for baseline wander reduction in ECG signal.

The determination of proper mother Wavelet functions, selecting the Wavelet decomposition levels and determination of thresholds at each sub-band are some stand still problems to remove different noises from the signal. Other limitations of Wavelet transforms are: (i) the sharp threshold value may leads to Gibb’s phenomenon on reconstructed ECG signal (ii) Soft threshold value may decrease the voltage level of the ECG waveforms and more over lessen the amplitudes of the R waves. Also if the signal and noise are of same amplitude or frequency, then it is difficult for distinguishing them by Wavelet de-noising. Therefore, Empirical Mode Decomposition (EMD) is used to overcome all these drawbacks.

Empirical Mode Decomposition

Huang et al. introduced Empirical Mode Decomposition (EMD), an adaptive data analysis method. In this method, the given signal is decomposed into a finite number of sub components which are called as Intrinsic Mode Functions (IMFs). The IMFs are obtained by a standard process called shifting and represents a signal in the oscillatory mode. EMD is special regarding its properties such as time localization, fully data-driven, not require prior knowledge on the originality of signal and information on IMF components in the data. It is efficient in removing baseline wandering and muscle noise without distortion to the ECG signal. However, EMD experiences some problems, like presence of oscillations with similarity in various modes or existence of oscillations of different amplitudes in a mode named as “mode mixing”. To mitigate these drawbacks, the Ensemble Empirical Mode Decomposition method is used.

Ensemble Empirical Mode Decomposition (EEMD)
Ensemble Empirical Mode Decomposition performs the Empirical Mode Decomposition over an ensemble of the signal with Gaussian white noise. The mode mixing problem can be avoid by adding white Gaussian noise incorporating the time-frequency range for gaining benefit of dyadic filter bank character of the EMD. The reconstructed signal with residual noise and various realizations of signal can produce wide variety of modes.

Principal Component Analysis (PCA) based De-noising

A mathematical procedure that transforms possibly correlated variables into smaller uncorrelated variables is called principal components. If the data set is normally distributed, then these components are independent only. Eigen analysis is the mathematical technique used in Principal Component Analysis (PCA). When eye artifacts and brain signals have comparable amplitudes, PCA cannot completely separate these two. Researchers have found that PCA based adaptive threshold method provides better Peak SNR compared to the Wavelet threshold method and small elapsed time so that the ocular artifacts in EEG signal can be removed effectively.

Independent Component Analysis (ICA)

ICA is an often preferable method applied to multichannel EEG recordings which remove several noises and artifacts from EEG signal by changing the contributions of noisy sources onto the scalp sensors. ICA separates time domain data into statistically Independent Component (IC) waveforms. ICA outputs two matrices: one that transforms EEG to IC data, and its inverse matrix that transforms IC back to EEG data. One of the advantages of ICA is that it is flexible in orthogonality and considers components as independent rather than uncorrelated. However, the variance maximization property is leaning by ICA components compared to PCA components.

Feature Extraction

After de-noising of the signals, physiological parameters which show variation to mental fatigue are considered to be features that need to be extracted for analysis of mental performance state. Feature extraction is a method usually used to extract the resources required to describe a large set of data properly. Both online and offline manners are available for feature extraction. Most of the researchers have done analysis on biosignals using FFT, DWT and Wavelet Packets (WP). WP can obtain all frequency bands with equal resolution with less computational complexity and faster performance than original FFT. Thus, WP analysis can provide more subtle information on approximation as well as detail space efficiently. Table 1 lists the most widely accepted feature extraction methods.

Table 1. Feature extraction methods for fatigue detection.

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Signals</th>
<th>Feature Extraction Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>ECG</td>
<td>Fast Fourier Transform (FFT)</td>
</tr>
<tr>
<td>15</td>
<td>ECG, EOG</td>
<td>Discrete Wavelet Transform (DWT)</td>
</tr>
<tr>
<td>16</td>
<td>EEG</td>
<td>Wavelet Packet Analysis</td>
</tr>
<tr>
<td>17,18</td>
<td>EEG</td>
<td>Fast Fourier Transform with Hann Window</td>
</tr>
<tr>
<td>19</td>
<td>ECG</td>
<td>Wavelet Packet Decomposition</td>
</tr>
<tr>
<td>20</td>
<td>EEG</td>
<td>Discrete Wavelet Packet Transform (DWPT)</td>
</tr>
<tr>
<td>21</td>
<td>EEG</td>
<td>Fuzzy Logic</td>
</tr>
<tr>
<td>22</td>
<td>EOG</td>
<td>Power Spectral Density by Welch’s Algorithm</td>
</tr>
</tbody>
</table>

Classification Techniques

There are three broad categories of classification approaches and they are Unsupervised, Supervised and Reinforcement. The similarity in modeling and supervising dynamic systems are the two main advantages of supervised learning technique. It is of two types: linear and nonlinear. The best classifier is chosen based on the mean classification rate with high value. Commonly used classifiers for detecting mental fatigue are K Nearest Neighbor (KNN), Support Vector Machine (SVM), Artificial Neural Networks (ANN), Linear Discriminant Analysis (LDA), Random Forest, etc. Biosignals and the corresponding classifiers used for the classification of mental fatigue state are listed in Table 2.
Table 2. Feature classification methods for fatigue detection.

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Signal Modality</th>
<th>Feature Classification Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>16,18</td>
<td>EEG</td>
<td>Support Vector Machine (SVM)</td>
</tr>
<tr>
<td>23,17</td>
<td>EEG</td>
<td>Random Forest (RF)</td>
</tr>
<tr>
<td>24</td>
<td>ECG</td>
<td>Quadric Discriminant Analysis, K Nearest Neighbor (KNN)</td>
</tr>
<tr>
<td>19</td>
<td>EEG</td>
<td>Kernel Principle Component Analysis (KPCA), SVM</td>
</tr>
<tr>
<td>22</td>
<td>EOG</td>
<td>SVM</td>
</tr>
<tr>
<td>25</td>
<td>EEG, ECG, EOG</td>
<td>KNN, SVM, Linear Discriminant Analysis (LDA)</td>
</tr>
</tbody>
</table>

FINDINGS

Fatigue is a state of diminished mental and physical efficiency. Due to mental fatigue, brain cells become totally exhausted which may result in serious effects if it is left unnoticed or untreated. So it is necessary to detect the onset of mental fatigue well before for overcoming the problems of mental inattention. Though fatigue detection using biosignals is intrusive, it gives accurate and reliable information. After the acquisition of signals, they undergo various stages of processing to provide significant information for the analysis. This paper ultimately focuses on highlighting the approaches applied in various stages of processing with all its pros and cons. Therefore, from the literature survey, we would like to infer a few points that need to be kept in mind before developing hybrid signal processing method that helps in efficient analysis of mental performance:

In case of ECG signal, Wavelet Transform exhibits an excellent performance on de-noising less noisy ECG signal. But recently Ensemble Empirical Mode Decomposition is found to be a promising approach for removal of baseline variations, power line interference and muscle artifacts from the ECG signal with minimum signal distortion in single step. This method is fully data driven, does not need any priori defined basis system as in Wavelet de-noising and thus making EEMD suitable for the analysis of non-stationary and non-linear signals.

When EEG signal is considered, the most significant noises that interrupt the EEG data are ocular and muscle activity. From the literature we found that EEMD-ICA method is efficient in removing ocular artifacts and EEMD-CCA is suitable for removing muscle activity. EEMD is noise assisted time-space analysis method, in which averaging process is carried out on the added white noise on random number of iterations and the component of the signal is generated by the averaging process. Thereby this kind of de-noising produces most reliable result for highly noisy data.

Among the most commonly used feature extraction techniques, FFT has less computation time for determining DFT but restricted to give only frequency information about the signal and it removes unwanted noise prevalent throughout the entire signal. But discrete Wavelet Transform allows removing noise at specific times in the data by providing multi resolution analysis. Compared to discrete Wavelet Transform, Wavelet Packet Analysis shows better performance, requires less computation and decomposition is performed both to detail and approximation coefficients.

The data in input sample mapped to a high-dimensional feature region which is termed as Kernel mapping which creates linearly separable problem by maximizing margin of separation. RF composed of arbitrary number of simple trees that determine the final result. Using tree ensembles significant improvement in prediction accuracy can be achieved. This provides good ability to pre-predict new data case. As the mean classification rate of RF and SVM are equally good compared with other classifiers for classifying mental fatigue state, any one among the two can be used for classification of mental performance state.

CONCLUSION

In this paper we have provided the comprehensive review on the different signal processing approaches that has been adopted so far to detect mental fatigue state from the signals like ECG, EEG and EOG. We have tried to provide the tabulated form of various preprocessing, feature extraction and feature classification methods that has been followed for estimating the fatigue state.
From our above discussion it is clear that the Ensemble Empirical Mode based denoising method with Wavelet packet decomposition based feature extraction technique is highly reliable and better method for processing biosignals. Support Vector Machine and Random Forest classifiers are suitable techniques which provides high classification rate to distinguish whether the person is mentally fatigue or alert.

Conflict-of-Interest: There is no conflict of interest.

Source of Funding: Self

Ethical Clearance: This is not applicable for this study.

REFERENCE

Engineering. 2007; 54(7): 1231-1237.


Team Based Learning an Active Teaching and learning Pedagogy: A Narrative Literature Review

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ABSTRACT

Active learning is essential for adult learning and numerous active learning pedagogies have been tested for their effectiveness. One of these pedagogies is Team-Based Learning (TBL). In team-based learning, students are encouraged to participate in individual and group learning activities. The role of the instructor or teacher is to act as a facilitator or guide, instead of the “sage on the stage”. Therefore, the objective of this paper is to evaluate the evidence of the effectiveness of team-based learning among various professionals.

Method: The literature search was done using electronic databases to search for primary research studies on the overall effectiveness of team-based learning. The databases of PubMed, CINHAL, and ProQuest were searched for applicable research studies. Results: There were 153 articles found on this topic. After reviewing the title and abstract, nine articles were reviewed which are full text, peer-reviewed and available free online. All of these studies reported that students were involved in both individual and group learning. Common tools used were individual readiness assessment tools, group readiness assessment, team-based learning (TBL) sessions by the faculty and student’s feedback. All of these nine articles reported that TBL is one of the best methods of teaching for both small and large groups.

Key terms: Team-based learning, active learning, effectiveness, narrative literature, literature review.

INTRODUCTION

The present generation of students expect more active learning and look forward to such opportunities in the educational system. However, it is always challenging for the instructor to adopt which type of pedagogy should be adopted which will maximize student learning. In the present day, an adult student at a higher level will have all the opportunity to get the resource materials based on the interest. If a student learns in the group, there is a great opportunity to interact with each other, discuss, and can clarify with each other’s perspectives. There are a different method of flipped classroom teaching methods are adapted at a higher level of education. Team-based learning is one of the flipped class/active teaching methodologies which is used for both undergraduate and postgraduate teaching.

Team-based learning is considered as flipped classroom teaching method for small-group learning which can be used effectively in both small or large classes. The method of executing TBL is students are divided into teams which should have 5-7 students in each team who need to be together throughout their class. Before starting the unit or module of the curriculum, students are asked to read some of the content related to the subject. In the initial phase of the TBL, students are asked to appear “Readiness Assurance Process,” or RAP. Explicitly, students have to complete a test individually, which is assessed by the “Individual Readiness Assurance Test and then the same test to be completed group when they come for the class which is group
Readiness Assurance Test,” or GRAT. The students can be graded based on both the individual marks and the group marks. After the students completing the group readiness assessment, the teacher encourages groups to appeal questions or teacher clarifies students’ questions which they have got an incorrect response. This process inspires students to review the material which they have received, evaluate their understanding and can defend the choice of answer. (3)

**Objective:** The objectives of this review is to identify the studies that have been conducted on team-based learning as a method of teaching and to assess the perception of students and the effectiveness of team-based learning from the available reviews.

**Methods:** The review was done using electronic databases to search for primary studies which are used team-based learning as a teaching pedagogy. The database like PubMed, CINHAL, and ProQuest was searched for potential research studies on TBL. Articles were limited to the English Language from 2008 to 2017. Both descriptive and evaluative studies were included to achieve the objective of this review. The studies on perception and experience of students on TBL and effectiveness of team-based learning were included.

**Results:** Figure 1 describes process of the data collection. The initial search resulted in 1409 hits. An additional search was done for the most relevant studies, written in English and restricted to open access and full-text articles. This search yielded 153 articles. The title and abstracts were reviewed and we found nine articles which more clearly reflected the objective of this review.

Table 1: Study characteristics: effectiveness of Team-based learning

<table>
<thead>
<tr>
<th>Author and year</th>
<th>Type of study</th>
<th>Sample</th>
<th>Sample size</th>
<th>Outcome Knowledge on</th>
<th>Tools used</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nancy A. Letassy, et al., (4)</td>
<td>Evaluative study</td>
<td>First-year MBBS</td>
<td>140 students</td>
<td>Endocrine module</td>
<td>Individual readiness assurance test IRAT, TRAT Written team response, Team contribution scores.</td>
<td>The course evaluations compared to traditional teaching method of lecture in 2003, TBL sessions over of course evaluation was found to be positive in the year 2006</td>
</tr>
<tr>
<td>McMullen, Cartledge, Levine, Iversen (5)</td>
<td>Evaluative and mixed method</td>
<td>Psychiatry residents</td>
<td>40</td>
<td>Addictions Psychiatry</td>
<td>Classroom Engagement Survey CES, and Value of Teams Scale TBL</td>
<td>There was a significant difference in the mean scores of the lecture method and TBL sessions (p &lt; 0.001)</td>
</tr>
<tr>
<td>Haj-Ali, Al Quran, 2013 (6)</td>
<td>Comparative study</td>
<td>III year BDS students</td>
<td>98</td>
<td>Removable denture prosthesis (RDP) module</td>
<td>IRAT, GRAT, and group assignment projects</td>
<td>Students’ mean performance (86.50 %±7.53) on the TBL sessions was significantly higher (p&lt;0.0001) than their mean performance on (78.71%±11.61) conventional exams</td>
</tr>
</tbody>
</table>

Figure 1: Identification of studies on TBL
<table>
<thead>
<tr>
<th>Study Authors</th>
<th>Study Type</th>
<th>Batch/Student Details</th>
<th>Sessional Marks</th>
<th>Assessment Methodology</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>There was an enhancement of knowledge from $3.667 \pm 0.82$ in pre-test to post-test $4.24 \pm 0.66$ scores and which was found to be significant ($p = 0.0052$).</td>
</tr>
<tr>
<td>Punja, Kalludi Pai, Rao, Dhar, (8)</td>
<td>Evaluative</td>
<td>first year MBBS students</td>
<td>241 TBL 128</td>
<td>Anatomy topics</td>
<td>Sessional examination MCQs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-TBL 113</td>
<td></td>
<td>The was a significant difference in sessional marks of students’ those who have gone through TBL sessions compared to Non-TBL sessions.</td>
</tr>
<tr>
<td>Noor Akmal Shareela Ismail, (9)</td>
<td>Evaluative</td>
<td>First-year medical students</td>
<td>194</td>
<td>Mutation and Mutation Analysis</td>
<td>Quiz, IRA, GRAT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Teaching medical genetics for MBBS students with TBL was very much accepted by the students. this was also evident in their examination marks.</td>
</tr>
<tr>
<td>Hamid Reza Koohestani and Nayereh Baghchehghi (10)</td>
<td>Evaluative</td>
<td>Nursing students of the second year</td>
<td>38</td>
<td>Psycho-socio climate of the classroom</td>
<td>Modified college and university classroom environment inventory (CUCEI) was used to measure the perception of the classroom environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The mean score 154.2 (SD 13.44) for the lecture method was lower than TBL method of teaching (Mean 179.8 SD,8.27), Which was found to be significant.</td>
</tr>
<tr>
<td>Chaya Gopalan &amp; Megan. Klann, (11)</td>
<td>Comparative</td>
<td>First-year Pharmacy students</td>
<td>187</td>
<td>Physiology</td>
<td>Knowledge questionnaire</td>
</tr>
<tr>
<td></td>
<td>study</td>
<td></td>
<td></td>
<td></td>
<td>The author reported that the flipped method of teaching enhances students’ performance by up to 17.5% compared to unclipped lecture method.</td>
</tr>
<tr>
<td>Neena Piyush Doshi, (12)</td>
<td>Comparative</td>
<td>first professional</td>
<td>126</td>
<td>“Hemodynamic disorders”</td>
<td>Individual readiness assessment Group readiness assessment and Student satisfaction score</td>
</tr>
<tr>
<td></td>
<td>study</td>
<td></td>
<td>students of second-year MBBS</td>
<td></td>
<td>The multiple comparisons test and summary showed that there was a significant mean difference between the didactic method, iRAT and overall scores. and it was concluded as TBL was effective.</td>
</tr>
</tbody>
</table>

As per the reviews noted in Table 1, five papers, one from medicine, two from the pharmacy, one from nursing, and one from dentistry reported the implementation of team-based learning as a teaching method that was integrated into their curriculum. The team-based learning process in all of the studies included: 1) prior review of the assigned content, 2) individual learning assessment, 3) group readiness assessment and 4) discussion by the faculty and feedback. The authors selected the topic as per their curriculum to test the effectiveness of team-based learning. In these studies, effectiveness was assessed in relation to Individual readiness, group readiness, response to examination post implementation of team based learning. Some of the studies also collected the feedback on team-based learning particularly students’ involvement, classroom environment, learning and on the faculty.

Letassy, Fugate, Medina, Stroup, and Britton (4) assessed the effectiveness of TBL at two campus institutions. They conducted 13 TBL sessions which included an initial assignment which was considered to be self-directed learning. Both individual and team readiness assurance tests were conducted. These
measure the accountability for learning and encourage a team problem-solving approach. These were followed by a discussion that was guided by the instructor. Over the course of the semester, students were assessed through a variety of modalities; individual and team readiness assurance tests, peer evaluations, and unit examinations. The overall course grades among students who participated in TBL, in comparison to controls, were higher. The results were improved in terms of the overall grade by 23% in 2006 compared to 9.5% for 2003 results and no students with failing grades in the course after transitioning to the TBL format.

Another study McMullen, Cartledge, Levine, and Iversen (5) included 44 psychiatry residents in Addictions Psychiatry who participated in a TBL module. The common tools used were the Individual Readiness Assurance Test (IRAT) and the Group Readiness Assurance Test (GRAT), both of which include 8–10 multiple choice questions. Initially, students participated in IRAT, followed by teams who were asked to complete the same questions together as a group, followed by a faculty-guided session. Immediate feedback from the participants was collected. The findings demonstrated that TBL sessions could improve classroom engagement compared to conventional lectures. However, subjects did not show any change in their attitudes regarding the value of teams.

Another study on TBL Haj-Ali and Al Quran (6) was conducted at a United Arab Emirates Dental School on the effect of a TBL module on knowledge of preclinical removable denture prosthesis. Ninety-eight students participated as teams. The effect of TBL was assessed with scores from session activities, which includes IRAT, GRAT, scores, written final exam and an OSCE. The results revealed that the students’ mean score on performance on the TBL sessions was significantly higher than their mean performance on conventional exams. Also, groups performed better on the Group readiness assessment test than the individual readiness assessment test.

Another group Yeshwanth Rao and Ganesh Shenoy (7) conducted a study on 6th-semester students of pharmacy (n = 36). The pharmacology of fluoroquinolones was the topic being addressed in the session. It was used to test the effectiveness of the TBL pedagogy. After the pre-test followed by the presentation of the cases by the groups, the groups discussed the cases among themselves and with other groups. All the main concepts relevant to the topic were discussed in an interactive manner. Following the case discussion, students completed individual post-tests. A significant difference between the pre-test (3.667 ± 0.82) and the post-test (4.24 ± 0.66) scores was observed (p = 0.0052).

Punja D et al., (8) conducted a study to assess the impact of TBL on student performance was conducted in 2014. The study included a TBL group consisting of 128 students and a non TBL group consisting of 113 students. The educational tools that were used were the IRAT, GRAT, and sessional examination. The median sessional MCQ scores of the students who had TBL sessions performed significantly higher than the other students in the non-TBL group (p<0.001).

An additional study was conducted at the University of Kebangsaan, Malaysia among 194 first-year medical students on the effectiveness of TBL. (9) The study utilized a module on mutation and mutation analysis. The author reported that using TBL to teach medical genetics was favorably received by the students. Students were active in their classes, and this was noticed in their final marks. This suggests that the TBL strategy can foster quality in teaching achieve learning outcomes and improvement in final grades.

Koohestani and Baghchegehi (10) conducted a study on the effects of team-based learning techniques on 38 second-year nursing students, focusing specifically on the psycho-social climate of the classroom. The first half of the 16 sessions of a cardiovascular disease nursing course sessions were taught by lectures and the second half using the team-based learning method. The modified college and university classroom environment inventory (CUCEI) was used to measure the perception of the classroom environment. Results of the study revealed that there was a significant difference in the mean scores of the psycho-social climate in the classroom when the TBL method was employed (179.8[ SD 8.27]) versus the lecture method (154.2 [SD 13.44]). Also, the results showed significant differences between the two groups in sub-square scores of innovation (p<0.001), student cohesiveness (p=0.01), cooperation (p<0.001) and equity (p= 0.03).

A recent study by Chaya Gopalan and Megan C. Klann (2017) (11) was conducted at St. Louis College of Pharmacy among 187 students of first pharmacy students. This study addressed the effectiveness of TBL versus
conventional teaching. The TBL group consisted of four to five students in a team and remained as a group for the entire semester. Their TBL activity includes application/analysis/interpretation questions. The author reported that the flipped method of teaching enhanced the students’ performance up in terms of overall grade to 17.5% compared to the unclipped lecture method.

Finally, Doshi (2017) conducted a study at Gujarat among 126 undergraduate students of second-year MBBS students. They were taught on Hemodynamic disorders by both TBL and the conventional method. All phases of TBL were included such as pre-class preparation: the individual readiness assurance test (IRAT), the team readiness assurance test (TRAT), the immediate feedback-assessment technique, written appeals, and instructor feedback. The marks scored in the 25 MCQ test on “hemodynamic disorders” was converted into a percentage. The mean student scores by didactic, IRAT and overall was 49.8% (SD-14.8), 65.6% (SD-10.9) and 65.6% (SD-13.8), respectively was significant (P< 0.001) in comparison of didactic versus iRAT and didactic versus overall score. Which is evident that students of the TBL group did well in MCQs test comparison with students who had conventional teaching method.

**DISCUSSION**

The following areas were identified as prominent themes in the studies discussed above:

**Reading before the actual class:** In all the studies which are listed above, students were aware of the subject and attempted to review material before coming to the class. This encourages the student to be more engaged in the subject matter so that they can absorb the material in an expedited fashion. The readiness before the class gives some insight to the subject which connects the students with both the teacher and subject. The teacher, however, needs to provide suitable and appropriate resource material, which facilitates assimilation and readiness for the individual assessment.

**Group interaction, cooperation and learning by sharing:** Students participating in group interactions learn from their own peer group members, which facilitates the broader educational experience. The group interaction encourages the learner to communicate and understand the perspectives of the other. For examples, during group application sessions, the teacher can facilitate group learning by providing a case study that requires critical thinking and problem solving. This promotes a sharing of ideas with critical analysis.

**Interactive and favorable classroom environment:** Learning was further promoted in studies where the students were given an opportunity to appeal and to clarify their doubts when posed with common problems. The students were asked to discuss the problem and to find the answer. The appeals process encourages the student to take ownership of the material and their own learning.

**Enhanced students’ performance and improvement in grades:** Overall grades were improved in all these studies compared with other traditions of teaching. For any teaching methodology, the ultimate aim is to improve the students’ performance. In TBL, student motivation for self-directed learning is enhanced through active engagement in the material, which may have the ultimate effect of improving grades.

**Improved Instruction:** Some studies in this review described instructors involved in team based learning to be adept at encouraging active learning. This serves to improve the quality of instruction and thereby enhance the performance of the student.

The themes above exemplify an innovative pedagogical approach that is becoming more mainstream in higher education in the West. These interactive approaches facilitate knowledge application and student accountability which in turn bolsters student performance.

The significant aspect of TBL is to enrich the self-learning and motivate the responsibility of the students. During the process of self-learning students will learn to plan, look for additional information on the interesting subjects and feel the experience of the outcome of self-directed learning.

As the present generation is expecting for innovative teaching methodology, they would appreciate the immediate outcome of what they have studied. The TBL has both the Individual readiness assessment and group readiness assessment which will provide the immediate feedback for the students, which helps the students to understand better if they have difficulty in individual readiness assessment. The adult learning required to
be cooperative learning as students should develop
the ability to interact with the peer group members,
understand others perspectives and learning to respect
each other. This is also supported by the Knowles’s
theory (1984) of adult education. (13)

The teacher has a great responsibility in constructing
the learning materials for the students, related to
objectives to be learned by self, in the group and
facilitated by the teacher. The faculty must create an
environment which can create a positive environment
for learning in a group.

In every profession, the faculty will try their own
method of teaching and learning activities. As per the
reviews, TBL is becoming a common method of teaching
at international institutions. In India, some professions
have started using TBL but overall implementation is
not currently prevalent. This may be due to the learning
styles and teaching methods expected by educational
councils, universities, or institutions. As students, it
is very common to expect everything to be taught
by the teachers in certain professions. As faculty, it is
necessary to create the habit of self-learning. As per
the reviews, TBL can be considered to be an opportunity
for innovative teachers to implement their course of
instruction and encourage adult learning. It is said that
“one key doesn’t fit for all locks”, hence the teacher is
required to implement a variety of teaching methods in
order to achieve expected outcomes.

CONCLUSION

Team-based learning is an active learning pedagogical method which can be used in institutions of
education at all levels. Enhanced learning outcomes
can be achieved through pre-class preparation, readiness
assessment, in-class application, a favourable classroom
environment and improved instruction. The qualities
of this type of learning may ultimately improve overall
student performance. Additional research is needed to
assess long term effectiveness.

Limitation: The review findings are limited to the
above studies which were full-text articles from open
access online sources only. We did not address in detail
the student’s perception of team-based learning. As these
studies were from a variety of professions, the subject of
instruction was not considered.

Conflict of Interest: None was reported

Funding: No funds were received for this project.

Ethical Permission: This article has been reviewed
by the Institutional Research Committee.

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A Structured Exercise Training Protocol after Renal Transplantation in Indian Population

Senthil Kumar Thillai Govindarajan, Soundararajan Periyasamy, Arun G Maiya, Ravi Annamalai, Venkatesh Natarajan

ABSTRACT

Renal transplantation has become successful, established definitive management for irreversible kidney failure. Exercise training after Renal Transplantation is recommended by many previous studies. The residual and emerging issues of physical limitations, cardiovascular risks, osteoporosis, obesity, diabetes and Quality of Life, all demands a custom made exercise training program. As exercise based renal rehabilitation is yet to gain solid roots which not on par with medical and surgical care, a structured exercise training protocol is much needed. Hence this structured, systematic and stepwise exercise training protocol that was tested for its validity and safety to renal transplantation recipients. The protocol structuring involved extensive published literature analysis, scrutiny/ approval of experts and tested for safety with the patient application. The training components, intensity, duration, frequency and precautions needed were keys aspects considered the protocol development, based on prevailing guidelines. The expert’s agreement for training protocol contents was analyzed with 5 points Likert rating and their feedback was used to refine contents. Safety of the protocol was established by its clinical application observing for any adverse response and patient feedback for ease of performance. Most of the component of training in all phases exhibited excellent agreement among the subject experts. There was no remarkable adverse response throughout the protocol on its clinical application. The bronchial hygiene therapy, mobility training, graded ambulation and strengthening exercise found 100% acceptance. The heart rate, Blood pressure, oxygen saturation and fatigability were showing a safe zone of training. The structured renal transplantation exercise training protocol was found valid and safe following renal transplantation. Tailor made programs could be developed with such graded exercise protocols after testing its impact on various health benefits in larger sample.

Keywords: Exercise training- Renal rehabilitation- Exercise protocol- Renal transplantation- Resistance training

INTRODUCTION

Renal Transplantation (RT) is done in end-stage renal disease nowadays with improved graft functioning. In spite of limited organ supply from deceased donors, the frequency of RT is steadily increasing by Living Donor Renal Transplantation (LRRT) and organs swapping measures.1,2 The reduction in Physical activity, QOL, and increased cardiovascular disease risks after RT emphasis the need for structured programs with exercise training and measures to improve Physical activity.3 Even though many studies examined the utility of exercise training, no specific, structured protocols in renal rehabilitation have been published. Few centers have trailed with individual training methods using published guidelines.3 American College of Sports Medicine (ACSM) guidelines of exercise testing and exercise prescription for chronic diseases recommend exercise training with tailor-made
components for a safe and optimal clinical application.6

Various studies have shown development of impairments including Physical inactivity, reduction in QOL, Cardiovascular disease (CVD) risks, cancer, new onset Diabetes after transplantation (NODAT), obesity, sarcopenia, malnutrition and osteoporosis after RT. The initial benefits of successful RT fades with progressive functional impairments.7-10 There are many recommendations in place to ameliorate these ill-effects with regular physical activity and exercise along with titration of medications as needed.11 Explicit spelt out protocols of exercise training is not found in renal rehabilitation literature after RT. The guideline needs to be translated into applicable measures of training, which was sparse to note. The need to increase physical activity and exercise to attain all health benefits and to prevent/minimize possible complications after RT is well documented.12 The barriers to exercise based renal rehabilitation including fear of graft injury, sociocultural restrictions, need for awareness of its importance among practitioners and necessary of team cooperation is widely described.13-15

**METHOD**

**The Protocol development**

The protocol development was a part of an ongoing study on exercise training effects after RT, which was approved the Institutional Ethics Committee (IEC/NI/11/DEC/26/83). The prevailing exercise guidelines and published studies were explored to identify the possible and needed components of training.16 Most studies didn’t spell out all components of training, except duration and modes of training. Recently consensus on guidelines to report of exercise protocols is published wherein parameters description is suggested.17 The present exercise protocol incorporated exercise parameters, precautions and patient education. The construction included generic and tailor-made components. The Structured Exercise Training Protocol after renal Transplantation (SET-ART) was done in Three Phases- Phase I: Acute care, Phase II: Phase Recovery, III: Progressive training which lasted up to 12 weeks after RT. The components of each phase, parameters of training and progression were framed based on guidelines and inputs from experts in field the renal rehabilitation. (Table 1)

### Table – 1 Structured Exercise Training Protocol after renal Transplantation (SET-ART)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Activity</th>
<th>Intensity (RPE 6-9)</th>
<th>Frequency</th>
<th>Precautions</th>
<th>Progression</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bronchial hygiene</strong></td>
<td>Breathing training, Incentive spirometer</td>
<td>600-1200 cc/sec</td>
<td>10-15 rpt/session</td>
<td>breath hold ≤ 3 sec</td>
<td>Multiple sniffs to single breath</td>
</tr>
<tr>
<td></td>
<td>Chest percussions</td>
<td></td>
<td>3 sessions/day</td>
<td>Spo2 &gt; 90%, Change in BP ± 10 mmHg</td>
<td></td>
</tr>
<tr>
<td><strong>Limb exercise</strong></td>
<td>Active assisted to active movements, PROM</td>
<td>5-10 movements/ session</td>
<td></td>
<td>Drains, IV lines, fistula hand, Pain</td>
<td>Active participation</td>
</tr>
<tr>
<td></td>
<td>(if-edema, inhibition present)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mobilization</strong></td>
<td>Turning in bed(assisted)</td>
<td>HR not &gt; 5-8 beats increase</td>
<td>Every 2h-4h</td>
<td>Drains, IV lines Drop in BP (if on epidural)</td>
<td>Reduction in external support</td>
</tr>
<tr>
<td>As tolerated (2-15 min)</td>
<td>Supported sitting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>Breathing exercises, Use of spirometer,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>importance of splinted coughing, need for ankle pumps &amp; chest physio, Care of drains/ IV lines during turning/exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### PHASE II-3 to 6 weeks-RECOVERY PHASE and PHASE III-6 to 12 weeks-Progressive Training Phase

<table>
<thead>
<tr>
<th>Mode</th>
<th>Activity</th>
<th>Intensity</th>
<th>Duration</th>
<th>Frequency</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm up &amp; warm down</td>
<td>Ankle pumps, arm curl ups, spot marching with support</td>
<td>Rhythmic &amp; slow</td>
<td>5-10 min</td>
<td>3-4 sessions/ Week</td>
<td>Suture site stretch</td>
</tr>
<tr>
<td>Aerobic</td>
<td>Walking/cycling</td>
<td>60-75% (Phase II) 75-90% (Phase III) HR max with RPE-11-14</td>
<td>10-20 min</td>
<td>3-4</td>
<td>HR ,BP periodic recording</td>
</tr>
<tr>
<td>Resistance training</td>
<td>Free weights Biceps curls, triceps Quads, ankle dorsiflexors</td>
<td>50-65% of 10 RM (Phase II) 65%-85% of 10 RM (Phase III)</td>
<td>3 -5 sets with 30-60sec pause</td>
<td>10-25 RPTS/ set</td>
<td>Avoid fistula hand RPE 11-14 maintained</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Calf, quadriceps, 1 Latissimus - self stretch Comfortable stretch 5-20 sec hold without breath hold Prior to exercise Limits of pain &amp; suture pliability Avoid loaded trunk bending</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Phase II:HR, BP monitoring, RPE regulation, muscle fatigue/ cramps-to report any discomforts Phase III: Training with more rely on RPE regulation, muscle fatigue/ cramps-to report any discomforts, encourage increase in activity participation(ADL)- return to job anticipated(part-time), scar mobilization (if adherence found)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Validation procedure

The feedback and content validation for all items in each component of exercise protocol was obtained from five members including one nephrologist, one surgeon and three physiotherapists all with minimum of 10 years of experience and expertise in patient care delivery. The approval was obtained by rating on a 5-points Likert scale with, 1= strongly disagree, 2=disagree, 3=neutral, 4= agree and 5= strongly agree. The components/items with score 4 or 5 was included, the components with score ≤3 was revised or omitted as per expert comment. The total number of 4 or 5 rating by the members was counted and the particular item/ component were considered valid to include only if 80% agreement was achieved, as described before. In the present study, a component was valid only if 4 out 5 experts agreed with score of 4 or 5. The agreement was also sorted for parameters such as exercise progression, patient education contents, intensity, frequency and duration in each phase of training. Further the safety of the components was confirmed by clinical application on 10 patients, under close supervision with safety measures. Any event of hypotension (<100/70), severe Dyspnea(Grade III or IV), Oxygen desaturation (below 85%), syncope or fall, suture dehiscence, undue pain or fatigue (lasting more than 24 hours) were considered as adverse response during training. Patient feedback on ease of understanding, undue fatigue, and any adverse responses was also noted, if any.
Table 2 Expert agreement and Patient feedback on validity of various components of SET-ART

<table>
<thead>
<tr>
<th>Component of Training</th>
<th>Expert Agreement (%)</th>
<th>Vitals instability</th>
<th>Adverse response/ feedback by patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronchial hygiene</td>
<td>100</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>Limb exercise</td>
<td>100</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>Mobilization</td>
<td>100</td>
<td>No</td>
<td>Hypertensive response, which normalized in 3-6 weeks of training</td>
</tr>
<tr>
<td>Warm up &amp; cool down</td>
<td>100</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>Aerobic</td>
<td>100</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>Resistance training</td>
<td>100</td>
<td>No</td>
<td>Nil, Muscle soreness in Phase II but resolved within 48 hours</td>
</tr>
<tr>
<td>Flexibility</td>
<td>80</td>
<td>No</td>
<td>Nil, Fear of suture stretch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise Parameters</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Intensity</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Duration</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>RPE based Progression</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>HR based Progression</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Patient education</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

RESULTS

The scoring by all five experts was tabulated and analyzed for agreement on validity of the components. There were nine components namely Bronchial hygiene therapy, limb exercises, mobilization, warm up/cool down, aerobic training, resistance training, flexibility, patient education and exercise parameters. Most of the component of training in each phase exhibited excellent agreement among the subject experts (Table 2). The bronchial hygiene therapy, limb exercise, mobilization, warm up/cool down, aerobic training, RPE based progression and strengthening exercise had 100% acceptance. Modification in timing of flexibility exercises and intensity progression (resisted exercise) were needed in early stage of training. There was no remarkable adverse response and the heart rate, Blood pressure and oxygen saturation were within safe zone of training (Table 3).
Table 3 Change in Vitals during the exercise protocol, Mean ± SD

<table>
<thead>
<tr>
<th>Phase</th>
<th>Heart rate (beats/minute)</th>
<th>SBP (mmHg)</th>
<th>DBP (mmHg)</th>
<th>Oxygen saturation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>13.3±2.35</td>
<td>43.5±10</td>
<td>6.8±1.48</td>
<td>89.8±2.57</td>
</tr>
<tr>
<td>Phase II</td>
<td>14.5±1.82</td>
<td>45.2±5.4</td>
<td>5.8±2.1</td>
<td>88.4±1.92</td>
</tr>
<tr>
<td>Phase III</td>
<td>13.2±1.78</td>
<td>38.3±4.2</td>
<td>4.9±1.4</td>
<td>90±2.4</td>
</tr>
</tbody>
</table>

Among 30 items presented to validation, 28 items (including patient education and exercise parameters in all three phases) were found to be valid as shown by agreement within the experts.

DISCUSSION

The need for structured exercise protocol was felt by all the experts; hence they readily participated in evaluation. The bronchial hygiene therapy was well accepted due to the risk of infection due to induction therapy, immune suppression. The mobilization, limb exercise and graded strengthening had good agreement as suggested by previous studies. The need to address the muscle weakness in RT as noted issue, paved way for 100% approval. The risk of fatigability, obesity, and ease of performance made acceptance of aerobic training.

Heart based exercise progression had an acceptable rating (80%), as few experts mentioned possibility of non-linear response due comorbidity such as diabetes and hypertensive response in early stages.21 The incorporation of Rating of Perceived Exertion had 100% agreement as well found to be clinically useful to do safe exercise progression. RPE is an established method to prescribe exercise intensity in most Cardio pulmonary rehabilitation programs, which was found true in this study also.22, 23

Even though many studies report on training benefits after RT, lack of published details on exercise training parameters makes replication limited. The exercise parameters were scrutinized to develop a safe and effective protocol structure as recommended by consensus on reporting of study protocols.24 This is perhaps first study to describe in detail the components and parameters of the training after RT. Moreover this study describes the early intervention (within three months of RT), which is sparse to note. Even though all items had good agreement and clinically safe in this study, it is required to be tested on larger sample before generalization of the effectiveness in rehabilitation after RT.

CONCLUSION

The Structured Exercise Training Protocol after renal Transplantation (SET-ART) was found safe and valid to be used following RT. The clinical utility in resolving post RT issues needs to be examined with further studies. The structured protocol could be used to frame tailor-made programs as per the needs of the individual among renal transplantation population.

Sources of Funding No funding obtained

Conflict of Interest Authors declare that they have no competing interests

REFERENCES


22. Chakraborty K, Trainee PG. A Comparative Study on the Effects of Comprehensive Rehabilitation in Uncomplicated Coronary Artery Bypass Grafting Patients from Rural and Urban India; 2007; 18:34-40


Association of TNF-α with Fasting Glucose, Insulin and Insulin Resistance in Complete Glycemic Spectrum

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ABSTRACT

Background: The aim of the present study is to assess fasting glucose, fasting insulin, insulin resistance, and inflammation in complete glycemic spectrum and to study the association between them if any.

Materials and Method: Participants (30-50 years) of either gender were enrolled. Based on their family history of diabetes and glucose levels, they were grouped into normoglycemic non-first-degree relatives of diabetes, normoglycemic first degree relatives of diabetes, Prediabetes and diabetes. Fasting Glucose, Fasting insulin and Tumor necrosis α (TNF-α) concentrations were analyzed. Groups were compared using one-way ANOVA with LSD posthoc analysis. Correlation between the parameters were done using Pearson’s correlation and linear regression analysis.

Results: We observed that fasting insulin, fasting glucose, TNF-α, and HOMA2 IR gradually increased as we moved along the glycemic spectrum from control, FDRD, prediabetes to diabetes, while HOMA2%S gradually decreased. HOMA2%B - there is an increase in FDRD as compared to controls, but it decreased in prediabetes and diabetes as compared to FDRD or controls. There was positive correlation between TNF-α and fasting glucose across the glycemic spectrum and no correlation with fasting insulin or insulin resistance.

Conclusion: Inflammation begins even in first degree relatives of diabetes and increases along with glucose levels along the glycemic spectrum.

Keywords: First degree relatives of diabetes, prediabetes, HOMA2%B, HOMA2%S, HOMA2IR, HOMA-IR

INTRODUCTION

Diabetes is increasing worldwide; Insulin resistance plays a significant role in the development of diabetes. Insulin resistance also leads to obesity, hypertension, dyslipidemia and cardiovascular diseases. Hence, it requires earlier attention. In addition, to this, diabetes subjects display increased levels of inflammatory markers. The underlying pathophysiology of diabetes development involves inflammation, which has been suggested by observing low-grade inflammation in subjects before developing diabetes. One study documented the role of inflammatory markers in predicting the development of diabetes. TNF-α is one of the major inflammatory markers, produced by various cells such as, macrophages, T cells, neutrophils and monocytes. Moreover, exaggerated expression of TNF-α is associated with obesity related insulin resistance. TNF-α causes metabolic derangements via various mechanisms - down regulation of genes involved in normal insulin action, targeting insulin signaling, inducing lipolysis and derangements of PPARγ, insulin-sensitizing nuclear receptor. Few studies have narrated the potential role of TNF-α.
causing insulin resistance (7-9). Increased levels of TNF-α has been documented in impaired glucose tolerance subjects (10, 11) whereas, some studies have not found any association (12). Further, contradictory reports regarding the association of inflammatory markers with insulin resistance in first degree relatives of diabetes (FDRD) (13, 14) shows that the role of inflammatory markers causing insulin resistance is still inconclusive. Even though, studies have reported, the association of TNF- α with insulin resistance in diabetes (15, 16) and prediabetes (17), no studies have attempted to assess the role of TNF- α with insulin resistance in complete glycemic spectrum. Therefore, in the present study we aimed to assess the association of TNF- α with insulin resistance across the glycemic spectrum.

**MATERIALS METHOD**

This cross-sectional comparative study was conducted in Department of Physiology, JIPMER, Puducherry. Approval from institutes scientific and ethics committee was obtained for the study protocol. 160 participants in the age group of 30-50 years of either gender were enrolled for our study. Based on their family history of diabetes and glucose levels, obtained by history and oral glucose tolerance test respectively, they were grouped into normoglycemic non-first-degree relatives of diabetes (n=40), normoglycemic first degree relatives of diabetes (n=40), Prediabetes (n=40) and diabetes on oral hypoglycemic drugs (n=40). Subjects with organic disease, morbid obesity, hypertension and smokers were excluded from this study.

**Biochemical markers:** The fasting and postprandial blood glucose was estimated by glucose oxidase-peroxidase method (Genuine Biosystem). Fasting insulin and TNF-α were measured in plasma that had been drawn after an overnight fast and frozen at −80°C until assayed. Fasting insulin (DIAsource, Belgium) and TNF-α (Diaclone, France) concentrations were measured by enzyme-linked immunosorbent assay according to manufacturer guidelines.

We used the standalone version of the Excel spreadsheet implementation of the Homeostatic model assessment calculator - HOMA Calculator ©The University of Oxford 2013; The calculator uses the HOMA2 model that provides insulin sensitivity (HOMA2%S) and beta cell function (HOMA2%B) as percentage, where 100% is normal. This updated model accounts for variations in peripheral glucose and hepatic resistance and considers renal glucose loss too (18). Hence can be used in hyperglycemic subjects and in subjects with high insulin section (19).

**Statistical analysis:** Comparisons of data across the groups were done using One-way ANOVA followed by post-hoc analysis using least significant difference (LSD). The statistically significance was set at p<0.05. Correlation between TNF- α and glucose, insulin, and derived insulin indices was done using Pearson’s correlation and linear regression.

**RESULTS**

Table 1: Comparison of insulin, glucose, TNF-α, and HOMA2 parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control (n=40)</th>
<th>FDRD (n=40)</th>
<th>Prediabetes (n=40)</th>
<th>Diabetes (n=40)</th>
<th>ANOVA P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Insulin (µIU/mL)</td>
<td>8.75±6.84</td>
<td>11.30±8.70</td>
<td>18.62±19.62</td>
<td>30.13±33.65</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fasting glucose (mg/dL)</td>
<td>86.75±9.25</td>
<td>89.35±6.53</td>
<td>114.05±6.81</td>
<td>158.75±15.84</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>TNF-α</td>
<td>9.78±7.11</td>
<td>15.02±11.93</td>
<td>19.50±19.70</td>
<td>37.15±39.57</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>108.72±66.72</td>
<td>119.87±60.25</td>
<td>101.35±65.46</td>
<td>83.56±76.36</td>
<td>.110</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>182.41±235.84</td>
<td>111.23±73.62</td>
<td>75.77±55.39</td>
<td>51.96±37.96</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>HOMA2IR</td>
<td>1.11±0.85</td>
<td>1.44±1.08</td>
<td>2.44±2.39</td>
<td>4.02±3.98</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Fasting glucose, Fasting glucose, TNF alpha, HOMA2 %S and HOMA2IR were significantly different across the groups, while HOMA2%B was not significantly different across the groups (Table 1).
From the values we can observe that Fasting insulin, fasting glucose, TNF-α, and HOMA2 IR gradually increases as we move from control, FDRD, prediabetes and diabetes, while HOMA2%S gradually decreases. HOMA2%B there is an increase in FDRD as compared to controls but decreases in prediabetes and diabetes (Figure 1 and Table 1).

Table 2: Comparison of Fasting insulin, fasting glucose, TNF-α, HOMA2 parameters – post-hoc analysis p values.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control vs FDRD</th>
<th>Control vs Prediabetes</th>
<th>Control vs Diabetes</th>
<th>FDRD vs Prediabetes</th>
<th>FDRD vs Diabetes</th>
<th>Prediabetes vs Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Insulin (μIU/mL)</td>
<td>.574</td>
<td>.031</td>
<td>&lt;.001</td>
<td>.108</td>
<td>&lt;.001</td>
<td>.012</td>
</tr>
<tr>
<td>Fasting glucose (mg/dL)</td>
<td>.261</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>TNF-α</td>
<td>.313</td>
<td>.062</td>
<td>&lt;.001</td>
<td>.388</td>
<td>&lt;.001</td>
<td>.001</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>.461</td>
<td>.626</td>
<td>&lt;.001</td>
<td>.221</td>
<td>.017</td>
<td>.240</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>.014</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>.217</td>
<td>.407</td>
<td>.407</td>
</tr>
<tr>
<td>HOMA2IR</td>
<td>.545</td>
<td>.016</td>
<td>&lt;.001</td>
<td>.068</td>
<td>&lt;.001</td>
<td>.004</td>
</tr>
</tbody>
</table>

Post hoc analysis (Table 2): As compared to controls all the parameters (Fasting Insulin, Fasting glucose, TNF alpha, HOMA2%S, HOMA2 %B and HOMA2 IR) were significantly different in diabetes, except for HOMA2%B prediabetes group was also significantly different in all parameters, while FDRD was significantly different only in HOMA2%S while other parameters were comparable. As compared to FDRD diabetes were significantly different in all the parameters except for HOMA2%S, while prediabetes was significantly different only in glucose values. Prediabetes and diabetes groups were comparable based on HOMA2%B and HOMA2%S, while other parameters are significantly different.
Table 3: Pearson’s correlation between insulin, glucose, derived insulin indices with TNF-α

<table>
<thead>
<tr>
<th>Parameters</th>
<th>r value</th>
<th>TNF-α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Insulin (µIU/mL)</td>
<td>0.106</td>
<td>.181</td>
</tr>
<tr>
<td>Fasting glucose (mg/dL)</td>
<td>.414**</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>-0.122</td>
<td>.126</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>-0.113</td>
<td>.156</td>
</tr>
<tr>
<td>HOMA2IR</td>
<td>0.129</td>
<td>.104</td>
</tr>
</tbody>
</table>

TNF-α shows significant positive correlation with fasting glucose (r = .414, p < .001, n =160) (Table 1 and Figure 1). There was no correlation between TNF-α, fasting insulin, HOMA2%B, HOMA2%S, and HOMA2IR (Table 3).

Figure 2: Correlation between TNF-α and fasting glucose

On regression analysis with TNF-α as dependent factor and fasting glucose as independent factor: TNF-α (pg/ml) = 0.3386 fasting glucose (mg/dL) -17.638. Only 17% of the changes in TNF-α could be explained by fasting glucose. After removing the seemingly outlier value of TNF-α (value -252), we observed that correlation was more between TNF-α and Fasting glucose (r = .444, p < .001, n =159). However, on regression analysis only 19% (increase of 2%) of the changes in TNF-α could be explained by fasting glucose.

DISCUSSION

Diabetes is reported to be an immune mediated disease-causing cytokine mediated acute phase response and low-grade chronic inflammation leading to atherosclerosis and other complications (20). TNF-α contributes in the development of insulin resistance, diabetes and altered adiposity (21). Contradictory to this study one study have reported no association of inflammation in early insulin resistant state among non-obese first degree relatives of diabetes (22). In view of these studies, it is essential to identify the association of TNF-α and insulin in complete glycemic spectrum.

Increasing TNF-α trend in the complete glycemic spectrum (Diabetes>Prediabetes> FDRD>Control group) suggests that low-grade subclinical inflammation starts even before the disturbance in glucose homeostasis (TNF-α: FDRD > control group), if there is a positive family history of diabetes. Inflammatory marker (TNF-α) have shown no correlation with fasting plasma glucose. De Carvalho VF et al also have reported, association of hyperglycemia with inflammation, which agrees with our study findings (23). The elevated levels of inflammatory marker and insulin prevails in diabetes regardless of their treatment (oral hypoglycemic agents). Despite the elevated levels of inflammatory marker and insulin there is no association between these two parameters with which we hypothesize that, severity of other pathophysiological mechanisms such as family history of diabetes, hyperglycemia, hyperinsulinemia (24, 25), body fat mass, glucose toxicity (24, 26) involved in insulin resistance could have masked the association of TNF-α and insulin resistance. Similar hypothesis is reported by another study which failed to show correlation between TNF-α and insulin resistant state in normoglycemic subjects (17). Even in diabetic individuals, Darko et al have reported varying levels of TNF-α and IL-6 depending on demographic status (urban and rural) and hypothesized that it could be due to varying physical activity levels and body composition (27). Even in our study only 17% of the variation in TNF-α could be explained by glucose levels.

Existing literature have documented insulin resistance in young lean subjects with family history of diabetes (28) which suggests the role of family history and no association between inflammation and insulin resistance among first-degree relative of diabetes (22). This emphasizes the potential role of heritability leading to insulin resistant state rather than inflammation. These earlier suggestions support our study findings. Memon et al have reported that among except for IL-6 no other cytokine (IL)-1β, IL-2, IL-4, IL-5, IL-6, IL-10, IL-12 (p70), IL-13, interferon-γ and TNF-α showed association with insulin sensitivity (29). In a similar study, Herder et al have concluded that subclinical inflammation (IL-6,
hscrep) is associated with increased insulin resistance and fasting insulin levels even in non-diabetic individuals \(^{(30)}\). However, they have not measured TNF-α. The lack of association between TNF-α and insulin resistance/fasting insulin might be due to the modest sample size in our study groups.

A study from Korea documented that concentration in serum TNF-α in prediabetic subjects were comparable with control group \(^{(12)}\), which is in accordance with our study findings. This could be due to exclusion of morbid obese subjects in our study, because the major source of TNF-α is from adipocytes \(^{(31)}\). However, non-significant elevation of TNF-α and significant hyperglycemic state indicates that subjects with prediabetes have high risk for developing cardiovascular disease and diabetes respectively.

Hyperglycemic condition is associated with increased oxidative stress which in turn induces redox-sensitive major pro-inflammatory transcription factor nuclear factor kappa B (NFkB), leading to inflammation \(^{(32, 33)}\). From our study findings, we could say that, hyperglycemia have been implicated in the process of inflammation than insulin resistance across glycemic spectrum. Taken together, the relationship between hyperglycemia, oxidative stress and inflammation is analogous with bidirectional causation. Although, we could not find any significant association between insulin resistance and TNF-α. The increasing trend of insulin levels and TNF-α in FDRD, prediabetes and diabetes imply the influence of heritability and shows that the inflammatory cascade pathway and insulin resistance pathway occurs simultaneously with a missing link which remains unresolved.

**Conclusion:** Inflammation begins even in first degree relatives of diabetes and increases along with glucose levels along the glycemic spectrum.

**Limitations:** There are various confounding factors such as physical activity level, level of stress, occupation that could have influenced the level of inflammation in the study subjects which were not matched.

**Source of funding:** JIPMER Intramural funding and extramural funding from Research Society for Study of Diabetes in India (RSSDI).

**Disclosure:** We are presenting here only a part of a larger PhD project

### References


Inter-Professional Education and Collaboration in Dentistry – Current Issues and Concerns, in India: A Narrative Review

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ABSTRACT

Aim: The aim of this review article is to address the issues and concerns regarding Inter-Professional Education and Collaboration in Dentistry from an Indian perspective.

Background: The field of Dentistry, Dental Sciences and Dental Education in the 21st century is evolving at a brisk pace with many professional developments in the Indian Scenario. To cater to this need and change, our methods of teaching and practicing dentistry should evolve. This is where the practice of Inter-Professional Education and Collaboration (IPEC) fits aptly and adds great value.

Clinical Significance: Adopting this practice will not only hone the skills of a dentist but also allows us to learn from other professionals, gaining a deep insight into their methodologies. It enables us to take a look at situations through a bird’s eye view for comprehensive assessments and improved health outcomes.

Keywords: Inter professional education, dentistry, collaboration, issues, India

BACKGROUND

Inter-Professional Education (IPE) is an approach where two or more professions learn about, from and with each other to improve collaboration and the quality of care.¹ To improve the future of dental care we need to adapt accordingly² so that IPEC becomes a priority for all resulting in improved health outcomes for all patients, including the poor and underserved.³ Adopting these practices is beneficial in building teamwork, communication, professionalism and also the confidence in managing different patients. It is based on a healthy understanding and respect for a multi-disciplinary approach while promoting sharing of professional perspectives and resources. IPEC has many advantages: Encouraging professionals to work in diverse situations, exposing them to a variety of patients; sharpening one’s critical thinking skills; promoting a deeper understanding and respect for the other healthcare professionals to work as a single, working unit⁴; stresses on evidence-based care, risk assessment and its subsequent management.

The practice of IPEC has four basic principles.

1. Respect for Inter-Professional Practice.
2. Responsibilities of a professional working in a multidisciplinary team.
3. Effective communication between the members of the team.
4. A collective effort by the group.

Eventually, the practice of IPEC will not be limited to just being learnt in classrooms but will be practiced in clinical scenarios in a most efficient way after overcoming various problems.⁵

REVIEW RESULTS

A curriculum with component of IPE/IPC should be started at the grass root levels. Conclusions from studies
already observing clinicians and students participating in such a model reported that it significantly increased their understanding of patients as they could observe things from the perspective of other health-care professionals as well. It also has a positive influence on their problem solving abilities, communication, and collaboration and provides a unique experience.

**IPEC is needed now because –**

1) Increased awareness about the fact that the oral cavity is a mirror to the rest of the body as most of the diseases are reflected in the mouth first;

2) With an increase in the average life expectancy, geriatric dentistry is being practiced more, which often needs a multi-disciplinary approach as multiple problems are expected; in old age.

3) An increased incidence of chronic diseases justifies the need for an inter disciplinary team to make decisions;

India is slowly catching up with the trend of IPEC and we hope that in the coming years it will be established as one of the supporting pillars of the Healthcare in India. Institutions have started offering fellowships in India providing a greater insight into IPEC. Surely, in the future, when the healthcare society looks back in retrospect, they will agree that IPEC was a blessing at the right time to the health care industry and patients.

**DISCUSSION**

**Areas which need collaboration:**

The need for adopting IPEC into the current system of teaching and practice has arisen as it has been realized that the oral cavity is not an isolated organ but an intricately connected one. An aging population, the shift of the burden of illness from acute to chronic care, and the lack of access to basic oral care demand that such a practice be adopted.⁶

**A) Pediatric dental care:**

Pediatric dental care requires a multidisciplinary approach by healthcare professionals in order to provide both primary as well as comprehensive care to infants and children through adolescence.⁷ Oral healthcare is usually independent from pediatric healthcare. It has been observed that about 90% of the infants up to the age of 1 year have seen a pediatrician but only 2% of those have seen a dentist. If both of them are a part of an Inter-Professional collaborative team, visits to the pediatrician are excellent opportunities to assess the oral health of the infant, apply fluoride and also to educate the parents on the importance of maintaining proper oral hygiene from childhood itself. Dental schools providing didactic courses along with clinical experience to train dentists and other pediatric healthcare providers have successfully bridged the gaps that occur between these professions thereby improving the standard of care for the infants and children from the very first day.

**B) Chronic diseases:**

Chronic disease management requires a dedicated team of healthcare professionals as these diseases target many organs and organs systems including oral cavity and one symptom cannot be treated in isolation without managing the others. The team working together should be able to coordinate the patient’s care by working as a tightly knit unit and will provide the best-possible treatment plan for such patients.⁸

Improving the patient’s oral health also leads to an improvement in the patient’s overall systemic health. While there is a clear-cut relationship between diabetes and periodontal disease, we should also acknowledge the fact that due to the complex nature of diabetes, the disease affects other organ systems as well too. The need for collaboration is also required for other diseases such as Cardio Vascular diseases, malignancies, mental health disorders like schizophrenia/ psychosis, etc. IPEC is a positive platform for facilitating medico-dental training in order to best serve the society and successfully treat such complicated diseases.

**C) Geriatric Dentistry**

Oral health for the geriatric patient is essential for the patient’s comfort, function and is an important component of overall systemic health. A decline may lead to pain, loss/reduction in function and subsequently a decreased quality of life. An increase in age, also leads to impairment of their mental abilities making it hard for them to maintain their oral health and hygiene. They are additionally burdened with a cocktail of other co-morbidities which cannot be tackled by a single healthcare professional alone. A sincere collaborative effort by the wide range of healthcare professionals like physicians, psychologists, physiotherapists, and dentists is required for optimal geriatric care.
Limitations and challenges:

Implementing this model is limited by one fundamental question: How do we apply what we’ve learnt in the classroom to the clinical scenario. The most important challenge that India faces before successfully establishing an IPEC model is to explain and to stress upon the healthcare professionals the importance and scope of such a model in real life practice.

Traditional dental schools do not integrate such a practice in their curriculum and do not adequately prepare the future dentists to provide comprehensive care to their patients. When exposed to IPEC models during their course, it will not only impress upon them the advantages of such a model but will also help them in adopting it in their practices.9

The logistics involved in setting up of such a model in a currently existing study program pose another challenge to the setting up such a practice successfully. The most common ones are changing the timings of the semester, the curricula and class schedules. Most of the institutions do not have their medical and dental institutions on the same campus. It places a challenge on the school authorities to find a suitable time and location for training various healthcare professionals for training them.10

It requires support from the local health-care units, the professionals involved and a lot of investment of resources in the setting up of such a team. It can be solved if the collaborative model receives support from the local authorities which would benefit everyone.11,12

A bridge needs to be made to gap the separate systems of dental and medical education so that the healthcare professionals are trained to examine the oral cavity adequately in order to screen for oral systemic complications or to educate the patient about the importance of maintaining good oral hygiene.13

Professional identity is another barrier to implementation of inter-professional collaboration. A sense of professional identity must be instilled in each of the health-care providers which leads to an increase in confidence of the professionals and enables them to act as a part of a team. At the same time, while stressing their importance to the team, they must also give up their professional autonomy and accept the fact that a team decision is eventually the best decision.14 A diverse team must be set up with representation from all the healthcare professions. Each professional should not only treat patients in their own way but also teach their methodology to others. Furthermore, importance of dental health must be stressed to the others in the team so that individual barriers of identity are overcome.15

The Indian Scenario:

In India, IPEC is still in the budding stage. It needs to rest on the shoulders of health care professionals who believe that IPEC is the future. For the very first time in India, Manipal Academy of Higher Education has started a fellowship program MAHE-FAIMER International Institute for Leadership in Inter-Professional Education.16

The objectives of the program are:
1) To encourage faculty understanding of IPE and practice;
2) To implement collaborative projects in IPE that are relevant to the health needs of the community;
3) To develop faculty who will be leaders in the practice of IPE.

Lessons to be learnt from North America:

Dental schools in the US and Canada have implemented IPEC in their curriculum and their everyday practice. It not just the implementation of such a model that is to be learnt, but the competency with which they are carried out too.17 A lot of these models form an effective collaboration between dentists and dental hygienists, calling upon them to provide services and care by effectively participating as an Inter-Professional team.18 These models should be constantly evaluated on a periodic basis to assess for their efficacy.19

To successfully implement an IPEC model, there must be full logistical support from the administrative personnel, personnel solely dedicated to the model, adequate participation from faculty, adequate number of specific cases for training of students and faculty and regular assessment of the participants.20

There is a lot more that we can learn from the recent developments, before IPEC can become a part of routine clinical practice in India. Eventually, we should be able to address the challenges of the world and welcome this practice.21

CONCLUSION

Inter-Professional Education and Collaboration is not just when two or three healthcare professionals
come together to work as a group. It is a model where the healthcare professionals working together share a mutual sense of respect for each other’s profession and out of that respect, they realize that the other person’s perspective is also a major part of the solution. It needs multiple approaches to provide the best possible treatment for the patient when everyone participates with a sense of responsibility.22

Faculty conditioning for development of an IPEC model aims to bring about awareness at the individual and the organizational level. Clearly, faculty members play a critical role in the teaching and learning of IPE and they must be prepared to meet this challenge.23

The butterfly effect is the sensitive dependence on initial conditions in which a small change in one state of a deterministic nonlinear system can result in large differences in a later state. Inculcating the model of IPEC into our practices, we will be improving the patient’s oral health in ways that will directly have a significant positive effect on the patient’s overall health. This change will mark the ushering in of a new era that will propel dentistry into greater heights. It is in line with Darwin’s proposal of “Survival of the fittest”. In order to survive the test of time, we need to adopt this practice. Studies have shown that professionals who have been a part of Inter-Professional collaborations came out to be more amicable, courteous, having a greater command of their communication skills and also have acute powers of critical analysis along with the fact that they enthusiastically embrace such models in practice.24 Such individuals have a greater respect for their fellow healthcare providers and often end up being pioneers in their chosen fields. It also instils a sense of collective responsibility in the team where each and every one of them acknowledges that all of them are responsible for the outcome, irrespective of whether it is positive or negative. Not only does it instill more confidence in the healthcare provider, but also changes their attitude.25

**Ethical Clearance:** Not indicated

**Source of Funding:** Self

**Conflict of Interest:** None

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Heart Rate Variability Non-Linear Analysis by Poincare Plot in the Complete Glycemic Spectrum

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ABSTRACT

Background: Prevalence of autonomic dysfunction in diabetes imposes marked cardiovascular risk in them. Heart rate variability (HRV) denotes the status of cardiovascular health. The present study was undertaken to study HRV using Poincare plot in the complete glycemic spectrum.

Materials and Method: We grouped the participants of either gender in the age group of 30-50 years based on their glycemic status and family history into four groups - 1. Normoglycemic subjects without family history of diabetes (control), 2. First degree relatives of diabetes, 3. Prediabetes, and 4. diabetes. We measured anthropometric variables, blood pressure and heart rate. We recorded lead II ECG and analyzed the RR interval using Poincare plot method. Groups were compared using one-way ANOVA followed by Bonferroni correction post-hoc analysis

Results: We observed that Poincare plot values such as SD1, SD2, SD1/SD2 ratio and S showed decreasing order as follows Control > FDRD > prediabetes > diabetes

Conclusion: heart rate variability decreases as the blood glucose value increases or even if you at risk for diabetes as with first degree relatives of diabetes.

Keywords: HRV, Poincare plot, autonomic dysfunction, glycemic spectrum, diabetes, T2DM

INTRODUCTION

Diabetes is a prevalent disease and major medical health burden. The incidence of type 2 diabetes mellitus is increasing globally. It is predicted that by the year 2025, diabetes incidence will increase two times than the year of 2000 (1). Diabetes has been associated with cardiovascular autonomic dysfunction in the form of vagal withdrawal and increased sympathetic tone subsequently causing sympathetic denervation (2-4).

Heart rate variability (HRV) is a non-invasive tool to assess the cardiac autonomic function (5). Conventionally, there are two methods for HRV analysis, linear and non-linear methods. Heart rate (HR) regulation by autonomic nervous system engages complex interactions between electrophysiological, humoral and hemodynamic parameters (6). In this view, heart rate is known to have nonlinear trends (7-9). Nonlinear analysis of HRV have been documented to evaluate the quality, scaling and correlation characteristics of the signals of variability and they do not assess the magnitude of variability (10). Non-linear method reflects interactions of central neural and autonomic nervous system (5). Poincare plot is a non-linear component which reflects the non-linear dynamics of HRV (11) and entire RR time series in a single
This approach of HRV quantification have recently emerged to disclose the non-linear alterations in heart rate which is not obvious. Many method of calculation have been suggested by many researchers for calculating Poincare plot (13-15). But, in this study we will present the Poincare plot scatter gram of our study group.

Many studies have assessed the linear methods in glycemic spectrum (16-18) but, no studies have assessed the nonlinear dynamics of HRV in complete glycemic spectrum. Therefore, in this study, we assessed especially the nonlinear dynamics of HRV using Poincare plot in complete glycemic spectrum.

**MATERIALS METHOD**

The present study is cross-sectional comparative study. After obtaining scientific and ethics committee approval. We screened volunteer subjects willing to participate in our study for their glycemic status using oral glucose tolerance test after obtaining written informed consent. Subjects with age between 30 to 50 years of either gender has been included for our study. We classified the participants into four groups based on their glycemic status and family history of diabetes – 1. normoglycemic non-first-degree relatives of diabetes (n=50), 2. first-degree relatives of diabetes (n=50), 3. Prediabetes (Fasting plasma glucose >100mg/dL and <125 mg/dL) (n=50) and 4. diabetes (n=50). We excluded subjects with any organic disease or smoking or overweight or morbid obesity or hypertension or under insulin treatment. Recording for female subjects was done during follicular phase of their reproductive cycle to avoid the influence of sympathetic overactivity during luteal phase (19, 20).

**Patient preparation:** Subjects were requested to report to Obesity research laboratory of physiology department at between 8 AM-11AM. On the day of recording, we have asked the subject to come with light breakfast, we also instructed them to avoid caffeinated beverages (12 hours before the test), nicotine (12 hours before the test) and vigorous physical activity. We maintained thermoneutral temperature (25°C) throughout the procedure. The procedure of recording lead II ECG was explained, and lab orientation was given prior to the recording to alleviate anxiety.

We measured their height (cm), weight (Kg), resting heart rate, systolic blood pressure (SBP) and diastolic blood pressure (DBP). We measured subjects, height (cm) using wall mounted stadiometer (VM electronics Hardware Ltd), weight (Kg) using digital weighing machine (Charder Electronic Co Ltd, Taichung, Taiwan 2013) and they were asked to take rest for 10 minutes in sitting position. Following which, we recorded resting heart rate and blood pressure using automated blood pressure monitor (Omron, HEM 7203 model, (Omron Healthcare Co., Kyoto, Japan).

**Poincare plot:** We followed guidelines formulated by Task force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology (5). After 5 minutes of supine rest, lead II electrocardiography (ECG) was recorded for 5 minutes. The conversion of analog to digital signal was done using 16 bit, 16-channel data acquisition system with Acqknowledge 3.8.2 software (Biopac MP36, USA). The sampling rate was 500 Hz and band pass filter of 2 Hz to 40 Hz was used. From the RR tachogram Poincare plot analysis was computed using Kubios 1.0 software (Bio-signal analysis Group, Finland) and the following parameters were noted.

SD1 is the standard deviation of short-term instantaneous beat-to-beat RR interval variability (minor axis of the ellipse in the diagram)

SD2 is the standard deviation of the long-term R-R interval variability (major axis of the ellipse in the diagram) (21, 22)

S: is the area of the ellipse which is the product of $\pi$, SD1, SD2. This reflects the overall dispersion and thereby the total HRV (23)

SD1/SD2: Represents randomness of HR (24, 25)

SD2/SD1: Correlates with LF/HF ratio. The ratio was positively correlated with Low Frequency (LF) and negatively correlated with High Frequency (HF) (26).

**Statistical analysis:** All the data were tested for normality. All parameters were normally distributed and are expressed as mean ± standard deviation. Comparison between groups were done using One-way ANOVA followed by posthoc test using bonferroni correction. All analyses were two-tailed and a significance level of p<0.05 was used in the study.
RESULTS

Table 1: Comparison cardiovascular parameters across the glycemic spectrum

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>FDRD</th>
<th>Prediabetes</th>
<th>Diabetes</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td></td>
</tr>
<tr>
<td>HR (beats per minute)</td>
<td>72.60 ± 9.15</td>
<td>75.60 ± 9.90</td>
<td>79.88 ± 12.38</td>
<td>80.12 ± 9.63</td>
<td>.001</td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>105.24 ± 8.02</td>
<td>103.14 ± 9.22</td>
<td>104.34 ± 8.97</td>
<td>104.18 ± 9.85</td>
<td>.715</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>80.76 ± 3.59</td>
<td>81.04 ± 3.53</td>
<td>80.20 ± 3.26</td>
<td>80.26 ± 3.72</td>
<td>.581</td>
</tr>
</tbody>
</table>

Values are expressed in Mean ± SD. Statistical analysis was done using one-way ANOVA. FDRD-First degree relatives of diabetes, HR-Heart rate, SBP- Systolic blood pressure, DBP- Diastolic blood pressure.

Table 2: Comparison of nonlinear dynamics of heart rate variability across the glycemic spectrum

<table>
<thead>
<tr>
<th>Poincare plot parameters</th>
<th>Control</th>
<th>FDRD</th>
<th>Prediabetes</th>
<th>Diabetes</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td></td>
</tr>
<tr>
<td>SD1</td>
<td>52.80±42.80</td>
<td>31.72±18.66</td>
<td>24.40 ± 19.13</td>
<td>17.75 ± 14.40</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD2</td>
<td>86.21 ± 43.17</td>
<td>63.66 ± 30.57</td>
<td>48.49 ± 28.60</td>
<td>44.94 ± 27.24</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD1/SD2 ratio</td>
<td>0.57 ± 0.18</td>
<td>0.49 ± 0.11</td>
<td>0.48 ± 0.18</td>
<td>0.39 ± 0.14</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD2/SD1 ratio</td>
<td>1.92 ± 0.60</td>
<td>2.18 ± 0.56</td>
<td>2.35 ± 0.80</td>
<td>2.99 ± 1.30</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>S</td>
<td>19480.50 ± 31205.73</td>
<td>7936.67 ± 8174.51</td>
<td>5094.41 ± 6292.97</td>
<td>3570.16 ± 6499.01</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Values are expressed in Mean ± SD. Statistical analysis was done using one-way ANOVA. SD1: minor axis of ellipse, SD2: Major axis of ellipse, S is area of the ellipse.

Table 3: Post hoc analysis using Bonferroni correction test for Poincare plot variables

<table>
<thead>
<tr>
<th></th>
<th>FDRD</th>
<th>Prediabetes</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD1</td>
<td>.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD2</td>
<td>.005</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD1/SD2 ratio</td>
<td>.046</td>
<td>.033</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SD2/SD1 ratio</td>
<td>.821</td>
<td>.087</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>S</td>
<td>.004</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>FDRD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD1</td>
<td>.989</td>
<td>.051</td>
<td></td>
</tr>
<tr>
<td>SD2</td>
<td>.136</td>
<td>.030</td>
<td></td>
</tr>
<tr>
<td>SD1/SD2 ratio</td>
<td>1.000</td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td>SD2/SD1 ratio</td>
<td>1.000</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Prediabetes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD1</td>
<td>1.000</td>
<td></td>
<td></td>
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<tr>
<td>SD2</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD1/SD2 ratio</td>
<td>.016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD2/SD1 ratio</td>
<td>.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FDRD-First degree relatives of diabetes, HR-Heart rate, SBP- Systolic blood pressure, DBP- Diastolic blood pressure, SD1: minor axis of ellipse, SD2: Major axis of ellipse. Comparison between the group was done using Bonferroni correction test.

**Table 1:** Groups were comparable based on systolic and diastolic blood pressure. Heart rate was significantly different among groups based on One-way ANOVA. On post hoc analysis it was observed that HR of control was significantly higher than prediabetes (p = .003) and diabetes (p = .002) while it was comparable with that of FDRD (p = .891). All the other groups were comparable based on HR.

**Table 2:** Groups were significantly different in all the parameters of Poincare plot analysis (SD1, SD2, SD1/SD2, SD2/SD1, and S) based on one-way ANOVA. We observed that SD1, SD2, S and SD1/SD2 values decrease and SD2/SD1 value increase as we progress in the order of Control group, FDRD, prediabetes and diabetes.

**Table 3:** On post hoc analysis SD1, SD2, SD1/SD2 ratio, S was significantly higher in control as compared to FDRD, prediabetes and diabetes group, while SD2/SD1 was significantly lower in control group as compared to diabetes alone.

FDRD and prediabetes groups were comparable based on all the parameters. SD1, SD2, SD1/SD2 ratio was significantly higher and SD2/SD1 was significantly lower in FDRD as compared to diabetes group.

SD1/SD2 ratio was significantly higher and SD2/SD1 was significantly lower in prediabetes as compared to diabetes group, while other parameters were comparable.

**DISCUSSION**

In this study, among the baseline cardiovascular parameters (HR and blood pressure), HR was significantly elevated in prediabetes and diabetes compared to control group. The increase in resting heart rate denotes vagal tone deterioration, because resting HR regulation is influenced by vagal tone (27). Comparable blood pressure across the groups denotes sympathetic denervation, across the group is yet to progress, as blood pressure is predominantly regulated by sympathetic tone (28).

In the present study, we found that control group have shown higher S, which is positively correlated with total HRV and SDNN (time-domain variable which reflects parasympathetic activity) among the four groups indicates physiological autonomic homeostasis. A similar finding was reported by Toichi et al (26). The significantly lesser S among FDRD, prediabetes and diabetes than control group emphasizes the autonomic dysregulation in these groups.

Berman M et al have documented positively association between SD1 and RMSSD (time-domain analysis parameter, which reflects parasympathetic activity) because there was similar mathematical equivalent for these two parameters in spite of their different origin (29). Hence, SD1 is similar to RMSSD, which is proven as an index of short-term HRV (5, 30, 31). We observed higher SD1 in the following order control> FDRD> prediabetes> diabetes, which signifies that parasympathetic tone decreases with hyperglycemia in graded manner (32).

SD2 can be used as a surrogate marker of sympathetic activity because the relationship between SD2 and Low Frequency (LF) (Frequency domain parameter, which denotes sympathetic activity) is double the relationship of SD2 with High Frequency (HF) (Frequency domain parameter, which denotes parasympathetic activity) (33). We observed SD2 decreases in the following order control> FDRD> prediabetes> diabetes, which signifies that sympathetic tone decreases with hyperglycemia in graded manner. This is the consequence of progressive reduction of total HRV as evident by decreased S in the same order, which displays future cardiovascular risk in FDRD, prediabetes and diabetes. This is further supported by SD1/SD2 ratio which also decreases in the following order control> FDRD> prediabetes> diabetes. This shows that decrease in SD1 (parasympathetic) is more than decrease in SD2 (sympathetic) as hyperglycemia progresses resulting in relative sympathetic overactivity.

We found reduced SD1 in FDRD, prediabetes diabetes than apparently healthy subjects and the similar findings (reduced SD1 in diabetes alone) have been documented in a study carried out in UAE (34). Also, our study demonstrates higher SD2 in FDRD, prediabetes and diabetes than control group which reflects sympathetic overactivity. Roy Bhaskar et al reported lower SD1 and higher SD 2 in diabetes which is in agreement with our findings (35).
Available evidences have reported the similarity of SD2/SD1 ratio with LF/HF ratio (marker of sympathovagal balance) (26, 36). Our findings suggest that, SD2/SD1 is significantly more in diabetes than FDRD, prediabetes and control group which indicates sympathetic over activity or vagal tone attenuation. Few researchers use reciprocal of these variables as a tool to assess randomness of the heart rate over sympathovagal balance (24, 25). Whereas, in our study, we found significant reduction in SD1/SD2 ratio in FDRD, prediabetes and diabetes than control group which could be due to reduced variability of heart rate among these groups indicating risk for future cardiovascular event. Many studies have demonstrated Poincare plots in diabetes and healthy subject (34, 35, 37), but these studies did not studied the entire glycemic spectrum which could have helped to identify the point of deterioration of autonomic homeostasis.

**CONCLUSION**

Total HRV(s), parasympathetic tone (SD1) and sympathetic tone (SD2) progressively decreases and relative sympathetic tone (SD2/SD1 and SD1/SD2) increases as we progress from normoglycemic controls, positive family history of diabetes, prediabetes to diabetes.

**Limitations:** Firstly, we studied only modest sample size. Secondly, our study is cross-sectional comparative study. Thirdly, we have done the nonlinear analysis using short-term HRV hence, our findings may not be applicable for long-term recording. Fourth, subgroup analysis was not done based on gender.

**Ethical Clearance:** We have obtained Institute Ethics committee clearance from JIPMER, Puducherry.

**Source of Funding:** JIPMER Intramural funding and extramural funding from Research Society for Study of Diabetes in India (RSSDI).

**Conflict of Interest:** None declared

**Disclosure:** We are presenting here only a part of a larger PhD project

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Knowledge and Perception of Nutrition and Health among Pregnant Women in Rural Central Kalimantan, Indonesia

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ABSTRACT

Background: Optimum nutrition for pregnant women is necessary for the healthy growth of the fetus including brain growth. For pregnant women can apply a balanced diet of food then they need sufficient nutritional knowledge to apply balanced nutrition in the daily menu. The purpose of this study to understand the knowledge and perception of pregnant women related to food and health.

Method: Using a qualitative research method, implemented in Sei Hanyo Village, Supang Village, and Bulau Ngandung Village, Kapuas Hulu area, Central Kalimantan. Data was obtained by observation technique and an in-depth interview with 34 participants, consisting of pregnant mothers (9 people), grandmothers (12 people) and husbands (12 people).

Results: Most of the menu of pregnant women is less balanced because pregnant women rarely consume vegetable and fruit. Furthermore, they still have the wrong perception about the nutritional needs of pregnant women. Most women have consumed liver, eggs, and fish but for iron tablets, almost all participants do not know the benefits and the diet rules. Food abstinence is still applied mainly by pregnant women with various sources of taboo such as the source of animal side dishes and vegetables. Hand washing habit has been done but not to use soap in running water. Besides, the role of the husband in supporting the fulfillment of nutrition in pregnant women is still low.

Conclusion: Maternal knowledge and perception related to nutrition and health are relatively low.

Keywords: Perception, Nutrition, Health, Abstinence, Iron Tablet, Pregnant Mothers

INTRODUCTION

Knowledge of nutrition is a set of knowledge known about food concerning optimal health. Nutrition knowledge includes an understanding of daily selection and consumption well and provides all the nutrients needed for normal body function(1). The level of knowledge of nutritional effect on attitudes and behavior in the selection of food will ultimately affect the nutritional state concerned. Inadequate nutrition knowledge, lack of understanding of good eating habits, as well as a lack of knowledge of the nutritional contribution of different types of food will lead to problems with intelligence and productivity. Increased nutrition knowledge can be done by running nutrition education programs conducted by the government. Nutrition education programs can affect the knowledge, attitudes, and behavior of children to their eating habits (2).

The period of pregnancy is one period of the life cycle that is prone to nutritional problems. Optimum nutrition for pregnant women is necessary for the healthy growth of the fetus including the growth of the brain. Pregnant women experiencing malnutrition, especially chronically lack of energy, are at risk of giving birth to babies with low weight and impact on the growth and development of children, intellectual development, and productivity in the future. For pregnant women to have good nutritional status during pregnancy, then a mother
should apply a balanced diet of nutrition (3).

Maternal nutrition fulfillment is influenced by many aspects, especially knowledge of pregnant woman nutrition, education level, and support of husband, family, and the community (4). In applying a balanced nutrition diet, an expectant mother needs to have sufficient nutritional knowledge to be able to use balanced nutrition in the daily menu. Previous research in other regions of Indonesia proved a relationship between the knowledge of pregnant women about the nutritional needs of pregnancy with nutritional status of pregnant women (5). Similar research also confirms that there is a real relationship between nutritional knowledge and nutrition practices in pregnant women (6). Furthermore, only about 2.5% of pregnant women who have good knowledge and the rest the knowledge of pregnant women on nutrition is still less, especially about causes of anemia, anemia symptoms, impact iron deficiency, factors that help and inhibit the absorption of iron and healthy weight gain during pregnancy (6).

This study aims to understand the knowledge and perception of pregnant women related to nutrition and health, especially about pregnant women’s food (types and quantities), consumption of liver, eggs, fish, use of iron tablets, pregnant women diet pattern, hand washing habit and the role of husband in supporting nutritious food diet intake and improving nutritional status of pregnant women in rural areas of Central Kalimantan, Indonesia.

METHODOLOGY

This research used qualitative research methods, implemented in Sei Hanyo Village, Supang Village, and Bulau Ngandung Village, Kapuas Hulu sub-district, Central Kalimantan. Data was obtained by observation technique and an in-depth interview with 34 participants, consisting of pregnant mothers (9 people), grandmothers (12 people) and husbands (12 people). The implementation of the study was conducted in September through October 2017.

RESULTS

Maternal knowledge about nutrition is very influential in the selection of nutritious food and the ability to prepare a balanced menu following the needs and tastes. In this research knowledge and perception of pregnant woman’s food including the type of food consumed and the amount of food consumed. Most pregnant mothers at the beginning of pregnancy (<1 month) experience cravings, and all expectant mothers as much as possible to fulfill craving desire because they do not want something wrong happens to the fetus. In the 1st month, they mostly only consume (there are also until 4-5 months) just started to consume rice, vegetables, and side dishes. What happened reflected in the results of interviews with the following informants: “Everything the pregnant women want must be fulfilled in order the baby will be healthy and nothing less.”

Most of the menu of pregnant women consists of carbohydrates, sources of animal meats, and vegetable. The food sources rarely consumed are the dish from vegetable and fruit. Most pregnant women make use of local food that easily found in their area.

Most participants said that the quantity of food consumed during pregnancy less than when they were not pregnant. Their appetites were going down during the early period of pregnancy. Besides, some other pregnant women consume less food because they were afraid that their fetus would be more significant and challenging to give birth. Only 1 person answered more food during pregnancy (about 3 cups of rice), and one person said she had the equal portion before and during pregnancy.

This is reflected in the results of interviews with the informants as follows:

Eat less during pregnancy, disorder and eat depending on taste.

Eat more time before pregnancy because when being pregnant the appetite was decreased.

Eat more when they were not pregnant because if they eat more on pregnancy period would make them difficult to breathe.

According to pregnant women in the research, good food is in the form of vegetables, fish, milk for mother and fetus healthy. There is also an opinion the best food for pregnant women is the source of plants grown not with pesticides / harmful fertilizers such as cucumber, spinach, bamboo shoots, young local ferns, and young rattan. Most participants believe that milk for pregnant women has the significant role in improving maternal and fetal health.

Based on interviews with pregnant women obtained the results that the portion of food in the period of
pregnancy and not pregnant is just the same as they proved from her previous pregnancy that they did not experience any severe problems. (2 participants). There is also another idea that the amount of food consumed by a pregnant mother less than usual is related to carvings, nausea, and vomiting experienced by pregnant women (3 participants). Further, participants said liver, fish, and eggs are perfect for the health of pregnant women. The most commonly consumed food ingredients are eggs, especially liver of chicken while liver of pork is rare because the price is quite high. The cost of chicken and fish is also high especially for freshwater fish.

Based on interviews with pregnant women, those with low socio-economic conditions do not know about iron tablets (Fe) and do not consume Fe tablets. Besides, based on interviews, most pregnant women apply food taboo such as not to drink banana heart because it can cause thick /hard membrane, pineapple can cause weak content/miscarriage, deer can cause death in children, cork-like fish can cause death in children, taro shoot cause the fetus challenging to get out and local fish named lawang and telan cause fetus hard to get out. Furthermore, the women also avoid eating suna - a traditional type of onion that is usually used as a spice of cooking and also to make chili sauce as it is believed it can cause the baby too big in the womb and cause bleeding. Also, yellow pumpkin, cucumber, and zucchini shoots are thought to cause the placenta to survive, and sticky and attached bananas can produce twin-born babies like the attached bananas. The tradition of dietary restrictions is strong enough in the villages of Bulau Ngandung, Supang and Sei Hanyo. But not all pregnant women follow the ban. Of the nine participants, four pregnant women did not observe the taboo, and the five participants still followed the abstinence imposed by their family. Of the five participants who went through abstinence, most of the participants had an inferior education.

Based on the interview it was found that all pregnant women do hand washing but not all using soap. Washing hands with soap are only done if the hands really look dirty and smelly. Hand washing mostly not in running water. The most frequent hand washing time is before eating. All participants have not been socialized with hand washing steps.

DISCUSSIONS

Because of carvings, women in this research consumed whatever they wish to destroy. Cravings are the effect of hormonal changes in pregnant women that lead to increased sensitivity to the smell and taste of food. Desires are universal during early pregnancy and are not related to particular physiological needs (9). However, the pregnant women in respective rural areas have consumed the standard food containing carbohydrate, protein, and vegetables available in the neighborhoods for the fetus to be healthy. Commonly consumed food ingredients are as follows: carbohydrate source: rice, cassava, bread yams. For protein sources are: shrimp, a type of catfish, fish, dried fish, pork, liver (of chicken, pork), chicken (domestic and poultry) and for vegetable sources are: spinach, kale, carrots, cucumber, cabbage.

Most pregnant women have the wrong perception of the nutritional needs of pregnant women as most respondents reduced the quantity of food consumed during pregnancy. This will reduce the supply of energy as two aspects influence the energy needs: the increase in basal metabolic rate to support the growing needs of the fetus and the accompanying network, as well as physical activity (9). This means that the energy and nutrient needs of mothers during pregnancy should be higher than when they were not pregnant which applied by the women in the research. This is by Regulation of Minister of Health Republic of Indonesia No. 75 the Year 2013 about nutrition adequacy rate Indonesia that stipulates that the additional energy needs of pregnant women in the first trimester of 180 kcal above the needs before pregnancy and the addition of 300 kcal in trimesters II and III. Furthermore, according to Regulation of Minister of Health No. 41 the Year 2014 about balanced nutrition guidelines writes that during pregnancy a mother should increase the amount and type of food eaten to meet the needs of infant growth and the needs of infant and mother to produce breast milk.

All pregnant women have not been exposed to the balanced nutrition messages and have not been exposed to information that milk is not a perfect food, but the nutrient of milk is equivalent to the nutrients found in animal side dishes. This is per the written in Minister of Health Regulation no. 41 The year 2014 that states one portion of milk is equivalent to one part of animal side dishes. For example, one serving of fresh fish in one medium slice (40 grams) equal to one cow milk (200 ccs). Participants who answered that the number of pregnant women eating less during pregnancy is mostly low-educated, who responded to the needs of both pregnant
and non-pregnant, most of them were middle-educated, while those who answered the number of pregnant food more than before pregnant were mostly highly educated. It indicates that one’s education level influence the level of knowledge and that pregnant women with low education tend to be reluctant and embarrassed to visit health facilities so rarely exposed to health information, especially information about nutrition. This is in line with the theory that the level of education determines the level of knowledge of a person, the higher the level of a person’s formal education the level of expertise will be higher (10).

The knowledge of the women in the rural areas of Central Kalimantan on Fe tablets is minimal. This situation occurs because the pregnant women never come to community health facilities. Furthermore, for other pregnant women have seen and know the tablet Fe but do not know the benefits and rules of taking the tablet. Because of this lack of knowledge, pregnant women do not consume Fe tablets every day as recommended leading to a deficiency in iron intake. The additional iron intake in pregnant women is needed to increase iron deposits of the mother (11). Of the iron deposits of the mother, the fetus also deposits iron that will be used to meet the needs of the baby born until the age of 46 months, especially if the milk is less iron. Besides, iron plays a role to meet the needs of the placenta and fetus and for the preparation of the mother to give birth is to replace the blood that is much missing due to the process of increased blood volume of the mother (12).

Most pregnant women avoided a sure to cultural belief. This is natural as, in Central Kalimantan mostly reside, the cultural beliefs leading too taboo is firmly believed and maintained as local wisdom (13). Pregnant women argue if abstinence is broken it will affect the fetus could be sick even died, difficult to give birth and also can change other family members. The average food that is challenged is a kind of food that cannot be consumed by a family for generations so that the food that is challenged between pregnant women varied with one another. The reason for abstinence is because they believe that whoever broke this prohibition will have difficulties during childbirth as well as abnormalities in infants. The figures generating tradition of the ban are their parents who received it from their grandparents. Abstinence is always reminded when daily chats even begin to be implanted since they are children to challenge some of these foods. Reactions that occur in society if there is a breaking taboo then the pregnant woman will be the topic of discussion and judged negatively by the public.

In general, husbands pay less attention to their wife’s intake during pregnancy. Participants are more concentrated as a breadwinner, while the management of food is left to the wife in full.

CONCLUSION

Knowledge and perception of pregnant mother related to nutrition and health especially about pregnant woman’s food, consumption of liver, egg, and fish, use of the iron tablet, hand washing habit with soap in running water and husband role in supporting nutritious intake and improving the nutritional status of pregnant women are still relatively low. Most pregnant women still apply local taboos, the food abstinence during pregnancy. There are a needs of education about nutrition for pregnant mother continuously and evenly in all society and support from husbands and community so that pregnant mother can apply balanced diet in order the fetus born will be healthy and intelligent.

Ethical Clearance: The Ministry of Health Polytechnic approved this research in Central Kalimantan, Indonesia. Ethical clearance was obtained from the Faculty of Medicine Palangkaraya University, Indonesia. A research permit was requested from the local health authorities. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil.

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A Hospital based Study of Clinico-Socioeconomic Profile of Musculoskeletal Tuberculosis

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ABSTRACT

Musculoskeletal Skeletal tuberculosis accounts for 30% of the tuberculosis occurring at extra pulmonary sites. The majority of the inflicted are in the economically productive age group and from low social strata. Aims of this study are to study the proportion of musculoskeletal tuberculosis and its determinants in KMC and associated hospitals in Mangalore and to study influence of socio-economic status on its prevalence. This is a cross sectional analysis of patients admitted or attending OPD who were diagnosed with musculoskeletal tuberculosis to KMC and associated hospitals. Socio-economic status were assessed according to modified Kuppuswamy method of social classification- 2012. Spine was the commonest site of musculoskeletal tuberculosis in this study. Highest incidence was found in socio-economic class 5 (50%). This study highlights correlation between lower socio-economic strata and higher incidence of tuberculosis and discusses the reasons for it.

Keywords: Tuberculosis, Socio-economic profile.

INTRODUCTION

Tuberculosis is probably as old as mankind. It’s continued presence amidst us is a sorry tale of missed opportunities by medical profession. Tuberculosis is one of major health problems in developing countries of the world today. It has made its impact felt throughout the ages ¹.

Musculoskeletal Skeletal tuberculosis accounts for 30% of the tuberculosis occurring at extra pulmonary ². The rate of extrapulmonary TB (EPTB) worldwide has reached 20%–40% (20% in children), as reported in recent ³,⁴&⁵. Young patients, females, and people of African or Asian origin seem to have a higher risk of developing ⁶,⁷. Of cases with EPTB, 10%–25% have musculoskeletal TB ²,⁸, leading to an estimated global prevalence of 19–38 million ⁹. The most commonly

affected site of infection is the spine (50%–69%), followed by the hip, knee, and ankle/foot (10%–13% each) [7]. Worldwide, 9 million new tuberculosis (TB) cases are annually reported; of these, approximately 1 million (13%) occur in human immunodeficiency virus (HIV)–positive ¹⁰.

The majority of the inflicted are in the economically productive age group and from low social strata. Hence this disease is rightfully called barometer of social welfare.

Aims of this study are to study the proportion of musculoskeletal tuberculosis and its determinants in KMC and associated hospitals in Mangalore and to study influence of socio-economic status on its prevalence.

MATERIAL AND METHOD

This is a cross sectional analysis of patients admitted or attending OPD who were diagnosed with musculoskeletal tuberculosis to KMC and associated hospitals in Mangalore over a period of one year from September 2013 to August 2014. Institutional Ethical committee clearance was taken. Hundred consecutive patients with diagnosed musculoskeletal tuberculosis

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were included in this study.

Diagnosis was based on microbiological or histopathological confirmation. Microbiological investigations included ZN staining for AFB, GeneXpert testing for TB and rifampicin resistance. Histopathological diagnosis was based on identifying tubercular granulomas in biopsy specimens.

Other investigations like ESR, total and differential count, chest radiograph were also done and recorded. All patients with diagnosed musculoskeletal tuberculosis were offered HIV testing and data recorded.

Clinical and social economical variables were recorded by three authors in the form of detailed questionnaire. The questionnaire contained questions on social variables (occupation, education, monthly family income) and clinical profile (deformity, signs and symptoms, neurological involvement, site affected, structures affected etc.).

Socio-economic status were assessed according to modified Kuppuswamy method of social classification-2012\(^1\) . Based on this patients were classified into five strata. Class 5 represented lowest socio-economic strata and class 1 represented highest socio-economic strata.

This study does not cover treatment and outcome in these patients.

RESULTS

Spine was the commonest site of musculoskeletal tuberculosis in this study (70%), followed by hip (12%), knee (6%), ankle (5%) (Table 1). No cases were found involving elbow joint. Highest incidence was found in 21-30 age group (22%), followed by 51-60 age group (20%). Least incidence was found in 0-10 years age group (Table 2). Male to female ratio in this group was 7:3.

<table>
<thead>
<tr>
<th>Joint</th>
<th>Percentage of Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spine</td>
<td>70%</td>
</tr>
<tr>
<td>Hip</td>
<td>12%</td>
</tr>
<tr>
<td>Knee</td>
<td>6%</td>
</tr>
<tr>
<td>Ankle</td>
<td>5%</td>
</tr>
<tr>
<td>Shoulder</td>
<td>4%</td>
</tr>
<tr>
<td>Elbow</td>
<td>0%</td>
</tr>
<tr>
<td>Wrist</td>
<td>3%</td>
</tr>
</tbody>
</table>

Table 2: Age distribution of musculoskeletal tuberculosis.

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>Percentage of incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>3%</td>
</tr>
<tr>
<td>11-20</td>
<td>8%</td>
</tr>
<tr>
<td>21-30</td>
<td>22%</td>
</tr>
<tr>
<td>31-40</td>
<td>18%</td>
</tr>
<tr>
<td>41-50</td>
<td>12%</td>
</tr>
<tr>
<td>51-60</td>
<td>20%</td>
</tr>
<tr>
<td>61-70</td>
<td>10%</td>
</tr>
<tr>
<td>71-80</td>
<td>7%</td>
</tr>
<tr>
<td>81-90</td>
<td>0%</td>
</tr>
<tr>
<td>91-100</td>
<td>0%</td>
</tr>
</tbody>
</table>

In spinal tuberculosis cases, dorsal Spine was most commonly affected (43%), followed by dorsolumbar junction (26%). Least affected was lumbosacral junction (3%).

HIV coinfection was seen in 12 cases. Eight of them had spinal tuberculosis and four of them had extra-spinal tuberculosis. Multi-drug resistant (MDR) tuberculosis was found in 4 cases.

Highest incidence was found in socio-economic class 5 (50%), followed by class 4 (28%). Least incidence was found in socio-economic class 1 (5%) (Table 3).

Table 3: Incidence of musculoskeletal tuberculosis in various socio-economic groups.

<table>
<thead>
<tr>
<th>Socio-economic groups</th>
<th>Incidence of musculoskeletal tuberculosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>5%</td>
</tr>
<tr>
<td>Class 2</td>
<td>6%</td>
</tr>
<tr>
<td>Class 3</td>
<td>11%</td>
</tr>
<tr>
<td>Class 4</td>
<td>28%</td>
</tr>
<tr>
<td>Class 5</td>
<td>50%</td>
</tr>
</tbody>
</table>

DISCUSSION & CONCLUSION

Spine is the commonest site of musculoskeletal tuberculosis. This has been well documented in literature like Agarwal RP et al\(^12\), Schwartz Y et al\(^13\), Netval et al\(^14\). In this study 70% of cases were involving spine.
This could be explained by the fact that our hospital is a tertiary referral centre where spinal surgery services are available. In referring hospitals, musculoskeletal tuberculosis other than spine are generally well managed because of non requirement of specialised surgical services.

In this study there is bimodal peak in age group incidence. This is similar to many studies reported like Colmenero J D et al16. Higher incidence in 20-30 age group can be explained by higher chances of exposure because of migration, occupation and also higher incidence of coinfection with HIV. Higher incidence in 50-60 age group can be explained by comorbidities like diabetes and pulmonary diseases.

Higher incidence of spinal tuberculosis in dorsal and dorso-lumbar region in this study is similar to the incidence in literature. Reasons attributed to this are: increased stress in dorsolumbar junction, proximity of cysterna chyli, drainage of Batson’s venous plexus etc16.

Tuberculosis is the most common opportunistic infections in HIV positive patients17. High incidence of coinfection shows higher prevalence of both diseases.

Highest incidence of musculoskeletal tuberculosis is found in the lowest socio-economic group. These results are similar to other studies done in India. Probable reasons for this are: illiteracy, poverty and ignorance about disease prevention. These findings are similar to findings other studies done in India like Agarwal et al12 and AAK Rao et al18.

To conclude, this study highlights the correlation between incidence of musculoskeletal tuberculosis and lower socio-economic status and therefore the need for socio-economic upliftment for eradication of tuberculosis.

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Conflict of Interest: Nil
Source of Funding: Self
Ethical Clearance: Institutional Ethical committee clearance taken.

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Knowledge, Attitude, and Practices about Obesity among Obese Homemakers in Urban Udupi: A Cross-Sectional Study

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ABSTRACT

Background: National Family Health Survey (NFHS) reported that percentage of women who were obese at age group 15 – 49 years increased from 11% to 15% from NFHS – 2 to NFHS – 3. In rural parts, under nutrition is more predominant, but in urban areas, obesity and overweight are more than three times higher, which may be owing to less physical activity levels in urban. The prevalence of obesity is greater for urban women and it is largely preventable through changes in lifestyle. It is important to assess the individual’s knowledge about the link between food, physical work, and obesity in planning any intervention strategies. So it is necessary to explore the knowledge, attitude, and practices on obesity before planning any intervention programs. Objective: To assess Knowledge, Attitude, and Practices (KAP) on obesity among obese homemakers in urban Udupi Method: A cross-sectional study was carried out among obese homemakers residing in urban Udupi. A total of 180 obese homemakers were recruited from 30 wards in urban Udupi community based on BMI criteria within the age group of 30 to 45 years. An investigator developed KAP questionnaire on obesity was administered to the participants. Results: The mean age of study population was 36.77 years. In knowledge section, 45% respondents had a low level of knowledge regarding obesity. 51.7% had a negative attitude towards obesity and 76% had a poor practice related to obesity. Conclusion: Women who are obese and homemakers by occupation residing in the urban community had a limited knowledge, negative attitude and worst in practices related to obesity. Keywords: Obesity, Knowledge, Attitude, Practices, Homemakers

INTRODUCTION

National Family Health Survey (NFHS) reported that percentage of women who were obese at age group 15 – 49 years increased from 11% to 15% from NFHS – 2 to NFHS – 3. In rural parts, under nutrition is more predominant, but in urban areas, obesity and overweight are more than three times higher, which may be owing to less physical activity levels in urban. The prevalence of obesity is greater for urban women. NFHS reported that only 9.4% women were obese in NFHS-2 whereas it was increased to 24% in NFHS -3. Obesity is largely preventable through changes in lifestyle. Motivation is an important factor in obesity prevention. The perception that one’s body weight is higher than normal for a healthy life is necessary as a prerequisite of an individual’s motivation to lose weight. It is critical to know about the awareness of causes, significance, and steps to be taken to prevent obesity. Hence it is highly important to assess the individual’s knowledge as well as their attitude and practices related to obesity. So it is necessary to explore the knowledge, attitude, and practices before planning any intervention programs.

OBJECTIVE

To assess Knowledge, Attitude, and Practice (KAP)
on obesity among obese homemakers in urban Udupi

**METHOD**

Study design, setting, and population:

This cross-sectional study was carried out during August 2017 in Udupi district, southern Karnataka after obtaining ethical clearance from Institute Research Committee (IEC 222/2016) Manipal. In this study, the unit of allocation is based on “wards”. The entire urban Udupi area consists of 35 wards. In that, 30 wards were selected. From each ward, 06 subjects were selected based on selection criteria. A total of 180 obese homemakers were recruited from 30 wards in urban Udupi community based on BMI criteria for Asians as per WHO (25 – 34.9) within the age group of 30 to 45 years.3, 4 In the community, Homemakers as per the selection criteria were identified through Door-to-Door survey method.

Data Collection:

For the study purpose, Investigator developed a knowledge, attitude and practice questionnaire (KAP) on obesity, specific to the Indian context. The questions were generated based on a semi-structured interview with obese homemakers, literature reviews and clinical experiences of the investigator. The content validity of the developed questionnaire was carried out involving experts in the field of obesity and related healthcare professionals. The tool consists of total 29 questions with 15 questions under knowledge, 06 for attitude and 08 in practice. It has questions related to obesity, diet and physical activities. The demographic profile of the participants was gathered after developing a good rapport with them. The developed KAP questionnaire on obesity was administered through a face-to-face interview by the investigator individually. The time duration to complete the questionnaire was 15 to 20 minutes. The responses for knowledge and attitude questions were “Agree”, “Disagree” and “Uncertain” and the options for practices were “Always”, “Sometimes” and “Never”. For Knowledge and Attitude components a score of 1 was assigned for a correct answer and 0 for a wrong response. “Uncertain” response was also considered as an incorrect response. For Practice component, “Always” response was assigned with score of 2, “sometimes’ as 1 and “Never” response as 0. Out of 29 questions, 06 questions were reverse statements to avoid bias and their scores were reversed while calculating the total score. The scores were summed up to obtain an overall score separately for knowledge, attitude, and practices for each respondent. Level of knowledge was categorized into “high” for respondents who scored 50% and above and “low” for those who scored less than 50%. Similarly, level of attitude was categorized into “positive” for respondents who scored 50% and above and “negative” for respondents who scored less than 50%. Practices were categorized into “good” for respondents who scored 50% and above and “poor” for respondents who scored less than 50%. Gathered data was entered and analyzed in SPSS version 15.

**RESULTS**

General characteristics of participants:

A total of 180 obese homemakers were recruited for the study. The mean age of study population was 36.77 years with a standard deviation (SD) of ±5.089 (range 30–45 years). 78.9% (142) participants were in obese grade I and 21.1% (38) were in obese grade II as per WHO classification for Asians. Among them, 65% (117) belonged to the nuclear family. In educational status, only 12.3% (22) were graduates. 21.1% of participants belonged to an upper class, 59.4% were upper middle, 13.9% lower middle and 5.6% of participants belonged to upper lower class. About 83.9% (151) were non-vegetarians.

KAP on obesity:

Knowledge regarding obesity:

The total questions under knowledge section were 15 with score varied with a minimum score of 0 and a maximum score of 15 (Table 1). Overall, 45% respondents had a low level of knowledge and the rest 55% of respondents had high knowledge about obesity.

Attitude regarding obesity:

The total questions under attitude category were 06 questions (Table 2) with a minimum score of 0 and a maximum score of 6. Overall, 45% respondents had a low level of knowledge and the rest 55% of respondents had high knowledge about obesity.

Practices regarding obesity:

The total questions under practice section were 08 (Table 3) with a minimum score of 0 and a maximum score of 16. Overall, 76% had a poor practice related to obesity.
### Table 1: Knowledge about Obesity

<table>
<thead>
<tr>
<th>No.</th>
<th>Knowledge questions</th>
<th>Agree</th>
<th>Disagree</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Obesity is a disease</td>
<td>79 (43.9)</td>
<td>62 (34.4)</td>
<td>39 (21.7)</td>
</tr>
<tr>
<td>02</td>
<td>Diet rich in fatty items can cause Obesity</td>
<td>106 (58.9)</td>
<td>42 (23.3)</td>
<td>32 (17.8)</td>
</tr>
<tr>
<td>03</td>
<td>Being obese can lead to Diabetes &amp; Hypertension</td>
<td>84 (46.7)</td>
<td>65 (36.1)</td>
<td>31 (17.2)</td>
</tr>
<tr>
<td>04</td>
<td>Maintaining an ideal body weight is not important for maintaining good health</td>
<td>51 (28.3)</td>
<td>115 (63.9)</td>
<td>14 (7.8)</td>
</tr>
<tr>
<td>05</td>
<td>Knowing the ‘Body Mass Index’ value is necessary</td>
<td>100 (55.6)</td>
<td>54 (30.0)</td>
<td>26 (14.4)</td>
</tr>
<tr>
<td>06</td>
<td>It is necessary to know the normal calorie value required per day for an individual</td>
<td>99 (55.0)</td>
<td>53 (29.4)</td>
<td>28 (15.6)</td>
</tr>
<tr>
<td>07</td>
<td>Being physically active is important for good health</td>
<td>132 (73.3)</td>
<td>23 (12.8)</td>
<td>24 (13.3)</td>
</tr>
<tr>
<td>08</td>
<td>Being physically active helps to maintain an ideal weight</td>
<td>113 (62.8)</td>
<td>47 (26.1)</td>
<td>20 (11.1)</td>
</tr>
<tr>
<td>09</td>
<td>It is important to know the normal levels of physical activity required for an individual</td>
<td>98 (54.4)</td>
<td>63 (35.0)</td>
<td>18 (10.0)</td>
</tr>
<tr>
<td>10</td>
<td>Doing all your home activities (cleaning, washing, walking to shop) manually will help you to maintain an ideal weight</td>
<td>78 (43.3)</td>
<td>85 (47.2)</td>
<td>17 (9.4)</td>
</tr>
<tr>
<td>11</td>
<td>Being physically inactive can lead to health problems</td>
<td>113 (62.8)</td>
<td>40 (22.2)</td>
<td>27 (15.0)</td>
</tr>
<tr>
<td>12</td>
<td>Doing physical activity (walking, cycling) will give you mental relaxation</td>
<td>66 (36.7)</td>
<td>55 (30.6)</td>
<td>59 (32.8)</td>
</tr>
<tr>
<td>13</td>
<td>Involving yourself in leisure time activity (outdoor games) will help to maintain ideal weight</td>
<td>84 (46.7)</td>
<td>64 (35.6)</td>
<td>31 (17.2)</td>
</tr>
<tr>
<td>14</td>
<td>Doing your daily activities by yourself (cleaning, dusting, washing), gives you similar benefits as exercise (cycling, swimming, jogging)</td>
<td>77 (42.8)</td>
<td>79 (43.9)</td>
<td>22 (12.2)</td>
</tr>
<tr>
<td>15</td>
<td>Women are often more overweight/obese than men</td>
<td>97 (53.9)</td>
<td>64 (35.6)</td>
<td>19 (10.6)</td>
</tr>
</tbody>
</table>

### Table 2: Attitude towards Obesity

<table>
<thead>
<tr>
<th>No.</th>
<th>Attitude questions</th>
<th>Agree</th>
<th>Disagree</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Regular checking of your weight is important</td>
<td>114 (63.3)</td>
<td>40 (22.2)</td>
<td>26 (14.4)</td>
</tr>
<tr>
<td>02</td>
<td>Is it necessary to keep in touch regularly with physicians for concerns regarding obesity</td>
<td>94 (52.2)</td>
<td>61 (33.9)</td>
<td>25 (13.9)</td>
</tr>
<tr>
<td>03</td>
<td>Diet management can prevent obesity</td>
<td>116 (64.4)</td>
<td>44 (24.4)</td>
<td>20 (11.1)</td>
</tr>
<tr>
<td>04</td>
<td>Do you feel stigmatized for being obese?</td>
<td>96 (53.3)</td>
<td>79 (43.9)</td>
<td>5 (2.8)</td>
</tr>
<tr>
<td>05</td>
<td>Do you feel shy to do physical activity/exercises?</td>
<td>100 (55.6)</td>
<td>78 (43.3)</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>06</td>
<td>Do you feel adherence to a physically active lifestyle/exercise is difficult?</td>
<td>56 (31.1)</td>
<td>108 (60.0)</td>
<td>16 (8.9)</td>
</tr>
</tbody>
</table>
Table 3: Practice related to Obesity

<table>
<thead>
<tr>
<th>No</th>
<th>Practice questions</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Do you have a habit of checking your weight regularly? (monthly or 3-6 months once)</td>
<td>6 (3.3)</td>
<td>24 (13.3)</td>
<td>150 (83.3)</td>
</tr>
<tr>
<td>02</td>
<td>Do you drink soft drinks with sugar added with them?</td>
<td>22 (12.2)</td>
<td>123 (68.3)</td>
<td>35 (19.4)</td>
</tr>
<tr>
<td>03</td>
<td>Do you eat fast foods? (fried/junk food, burger &amp; chat items)</td>
<td>34 (18.9)</td>
<td>116 (64.4)</td>
<td>29 (16.1)</td>
</tr>
<tr>
<td>04</td>
<td>Do you calculate your calorie intake?</td>
<td>6 (3.3)</td>
<td>7 (3.9)</td>
<td>167 (92.8)</td>
</tr>
<tr>
<td>05</td>
<td>Are you involving yourself in physical activity?</td>
<td>20 (11.1)</td>
<td>75 (41.7)</td>
<td>84 (46.7)</td>
</tr>
<tr>
<td>06</td>
<td>Do you maintain the required levels of physical activity?</td>
<td>17 (9.4)</td>
<td>63 (35)</td>
<td>100 (55.6)</td>
</tr>
<tr>
<td>07</td>
<td>Do you measure your BMI/waist circumference regularly?</td>
<td>0 (0)</td>
<td>4 (2.2)</td>
<td>176 (97.8)</td>
</tr>
<tr>
<td>08</td>
<td>Do you follow weight reduction strategies as advised by physician/any others?</td>
<td>0 (0)</td>
<td>36 (20)</td>
<td>144 (80)</td>
</tr>
</tbody>
</table>

DISCUSSION

Knowledge, attitude, and practices (KAP) studies were used to understand the extent of awareness and their readiness to adapt to risk-free behaviors. Obesity is one of the important health challenge leading to many health hazards and enormous financial burden. In our study, only 55% had high knowledge, almost half of the participants had a low level of knowledge. The current findings may be due to their low educational status and they were homemakers by occupation which would have limited their knowledge about obesity. Similarly, almost half of the participants had a negative attitude towards obesity. Attitude refers to the traditional beliefs and ideas of the individuals or community which is important for appropriate practices. It is necessary to address issues related to attitude as positive attitude leads to appropriate practices. In our study, about two-thirds of respondents were poor in practices related to obesity. This may be due to poor knowledge and negative attitudes towards obesity. A study related to KAP carried out in south India about complications and causes of obesity among women, found that 43% of women failed to recognize that obesity can lead to diabetes and 37% failed to do so regarding heart attack. This lack of awareness in both rural as well as urban groups indicates a need for an educational intervention to create awareness. Hence, it is necessary to explore the knowledge, attitude, and practices before planning any intervention programs.

CONCLUSION

Overall women who are obese and homemakers by occupation residing in the urban community had a limited knowledge, negative attitude and worst in practices related to obesity. As obesity is associated with many health hazards, it is important to initiate a community level health intervention programs suitable specifically to the target population in the community, based on their current levels of knowledge, attitude, and practices.

Conflict of Interest: Nil

Source of Funding: Self

REFERENCES

Behavioural Analysis of Consumers Towards Fairness Cream Brands and their Preferences; with Reference to Hul, Madanapalle, Chittoor District

Kuchi. Srinivasa Krishna¹, Shaik Ahamed Basha¹

¹Asst.Professor, MITS School of Business, MITS, Madanapalle, Chittoor District

ABSTRACT

There is substantial evidence that human behavior is to a large extent driven by motives/rewards and goals. In global era the men and women become beauty conscious and beauty become essential in our day to day life. All the marketers understood the attitudinal changes, lifestyles and changing environmental conditions taken into consideration to identify the solution for their problem to enhance the glamour. Today in India, numerous companies produced Cosmetics & Creams which suits to the personality of the consumer. Indians are witnessing a paradigm shift from traditional methods of using home products to modern methods of using branded cosmetics and fairness cream to become fair. Initially they realized about the men’s market and there plenty of fairness creams introduced in market This made fair changes in market and market stakes of the brands. Today this companies are working on the preferences of the customers and their likes to succeed in the market by the way of differentiation strategies. Availability of massive number of cosmetic brands creates the competition given a scope to the researcher to study the buying behaviour of consumers of fairness creams in Madanapalle Chittoor District.

Keywords: fair, massive, preference, personality

INTRODUCTION

“Black skin white Masks” book author Fanon says “As much as the white man thinks himself superior to the black, the black man desires to be white. Indeed, black men want to prove to white men, at all costs, the richness of their thought, the equal value of their intellect”. “For the black man, there is only one destiny. And it is white”

Business environment today is turbulent as never before and the service industry as promising as never before. In this era of intense competition where consumer became prosumer. In the dynamic environmental conditions, it is the need for a marketer to act proactively and reactive sti to understand the insights of consumer. As there is constant change in the living standards, trend, fashion and change in technology, consumer’s attitude towards the purchase of product varies. Understanding these factors is of utmost importance because the marketing of product is largely dependent on these factors. Thus, consumer behaviour serves as a successful tool for marketers in meeting their sales objectives.

Behavior is generally motivated by a desire to attain our goal. In order to study the consumer behavior we should study their insights i.e. perceptual (how (s)he and to selects, understands and interpret the stimuli) cognitive (how he thinks and analyses about the stimuli) and motivational mechanisms (how he or she get inspire to respond to the stimuli).

The study of consumer behavior examines their emotions, attitudes and preferences affect buying behavior. It means that the characteristics of the consumer how (s) he reflects towards the predisposed object. The study of consumer behavior is concerned with how a consumer behaves when he consumes time, energy and money and get involved to buy the product and
the aspects of purchasing behavior - from pre-purchase activities through to post-purchase consumption and evaluation activities. Understanding purchasing and consumption behavior is a key challenge for marketers. In order to understand them the marketer should strive to get in touch with them to find their insights and behave because due to the availability of massive number of brands, there is no loyalty, increased brand switching tendency, changing life styles i.e newness in product. By these factors competency became tough to the marketer and does not have guesstimate for their survivance. That’s why this behavior analysis of a consumer gained the immense popularity and it became an ever ending subject.

**REVIEW OF LITERATURE**

According to Bhattacharya1 stated in her article “Indian Quarterly-Indian Beauty Market Roundup” that, India is one among the fastest 21 growing beauty markets in the world and that the colour cosmetics market segment is growing faster as more and more women become aware of beauty products and tend to use make-up products.

Vandana Sabharwal et al2., identified in their study, ‘Women Buying Behaviour and Consumption Pattern of Facial Skin Care Products’ that moisturizers were found to be preferred by most of the consumers followed by anti-ageing cream and toners preferred by aged women.

Michelle Guthrie et al3., in their study entitled, “The Effects of Facial Image and Cosmetic Usage on Perceptions of Brand Personality” stated that in the total quantity of cosmetic consumption, the consumer’s facial image may have an influence. Women tend to use more cosmetics when they have self-satisfaction of their facial image. The investigators opined that the consumers who were with a positive facial image had more confidence in using cosmetics to enhance their beauty. They creatively manipulated their facial features which resulted in higher level of cosmetic use.

Thomas F. Cash et al4., conducted a controlled experiment and published the article, “Effect of Cosmetics Use on the Physical Attractiveness and Body Image of American College Women”. The result of the study revealed the following facts: male consumers felt that women who were physically attractive were wearing cosmetics; women without cosmetics were not beautiful to the eyes of others.

Neeraj Kaushik et al5, conducted an analysis entitled, “A Study on consumers Buying Pattern of Cosmetic Products in South Haryana”. The study pointed out that quality and price were found to be the important criteria for buying cosmetics. Lower income group people gave more importance to price, while those of higher income group gave more importance to quality and brand name.

Kulkarni et al6, concluded in their study, ‘A Factor Analysis on Product Attributes for Consumer Buying Behaviour of Male Cosmetics in Nagpur City’ that the brand, quality, advertising, store location were the important factor for men while buying personal care products.

A research titled “Study of consumption pattern of cosmetic products among young males in Delhi” by Abdullah Bin Junaid and Dr. Reshma Nasreen7 inspected that purpose of using a skin care product is not affected by age group, the place of buying skin care product has no significance with the income of a person and cosmetic consumer’s income doesn’t play any role while choosing a brand.

According to Eeve Mari Karine8 in her article, “The Cosmetics Market Facing a Chan” stated that, the cosmetics market in Finland has undergone a dramatic change. The people in Finland choose their cosmetics very carefully. Cheap cosmetic brands were now preferred by them.

**STATEMENT OF THE PROBLEM**

Order of preferences of fairness brands and attribute preferences may vary with the region to region with respect to the behavior of the consumer. That’s why different brands can have the noticeable market share. The researcher wants to know the behavior of consumer of Madanapalle region of Chittoor district with respect to the attributes of different fairness cream brands and to examine which attribute could be more preferred by the residents of Madanapalle and is having the more weightage in Madanapalle region. Hence the researcher made his effort towards the behavioral analysis of consumers towards fairness cream brands.

**NEED FOR THE STUDY**

Due the changes in polluted environmental condition continuous depleting ozone layer has put us at a higher risk of get affected from the harmful rays of
the sun. Because of damages in ozone layer, the UV rays are directly attacking on skin. Acute as well as chronic sun exposure can induce clinical and biological damage to the skin such as photo ageing, pigmentation, sunburn etc. The essential skin proteins, such as collagen, keratin, and elastin are required to protect our skin from UV ray exposure and keeping the skin smooth and healthy. That’s why the researcher made a modest effort to find all the brands are alike or different in the context of its attributes and outcome. Finally, he wants to prove the appropriate definition for “BRAND” (i.e. PROMISE) and its impact on consumer behavior.

OBJECTIVES OF THE STUDY

To examine the difference in the attributes of different fairness cream brands

To analyze the impact of attributes on consumer buying behaviour

DATA COLLECTION:

Primary data:

Collected the data from 150 customers with the help of well-structured questionnaire regarding their behavior towards different fairness cream brands and analyzed the impact of its attributes on their behavior.

Secondary data

Collected the information from websites, reputed national and international journals to obtain the data in order to understand the buying behaviour

Sample Size: 150

Sample Method: Random sampling

Statistical Technique used: Analysis of data by using SPSS software. The Regression analysis and ANOVA tests used to analyze the data.

LIMITATIONS OF THE STUDY

The study area covers only in Madanapalle only

The accuracy of findings of study depends upon the correctness of the responses provided by the respondents.

PERSONAL CARE SECTOR IN INDIA: AN OVER VIEW

According to the Business Standard, July 2008, 2016 reveals that Personal care market to touch US$ 20 billion in India by 2025. The consumption pattern of cosmetics among teenagers went up substantially between 2005 and 2015 because of increasing awareness and desire to look good. In fact, this product category is among the fastest growing segments for the manufacturers of a range of products including body sprays. Over 68 percent of young adults feel that using grooming products boost their confidence.

The market size of India’s beauty, cosmetic and grooming market will reach $ 20 billion by 2025 from the current $ 6.5 billion on the back of rise in disposable income of middle class and growing

SEGMENTED FAIRNESS CREAM BRANDS ON THE BASIS OF CATEGORY

<table>
<thead>
<tr>
<th>Low end</th>
<th>Middle end</th>
<th>High end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair and Lovely</td>
<td>Biotique coconut Milk</td>
<td>L’Oreal Plenitude White Perfect range</td>
</tr>
<tr>
<td>Goodrej fair “Glow” and fair “ever”</td>
<td>Oriflame Love A “Fair”</td>
<td>Lancome’s Blanc Cristal range</td>
</tr>
<tr>
<td>Freschia</td>
<td>Oriflame natural Northern Light</td>
<td>YSL’s Blanc Absolu Serum</td>
</tr>
<tr>
<td>Vocc Turmeric</td>
<td>Avon VIP Fairness Cream</td>
<td>Clinique’s Active White Line</td>
</tr>
<tr>
<td></td>
<td>Lotus fairness Gel</td>
<td>Elizabeth Arden’s Visible Whitening Pure</td>
</tr>
<tr>
<td></td>
<td>Samara Fairness Cream</td>
<td>Intensive capsules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estee Lauder’s White Light.</td>
</tr>
</tbody>
</table>

ANALYSIS AND DATA INTERPRETATION

Six brands like Fair and lovely, patanjali, L’oreal, Himalaya, Garnier, Maybeline and five attributes have taken like price, quality, brand image, quantity and fairness for the study of consume buyer behaviour
Table 1 ANOVA

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>6.812</td>
<td>5</td>
<td>1.362</td>
<td>4.776</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>41.081</td>
<td>144</td>
<td>.285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47.893</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>43.891</td>
<td>5</td>
<td>8.778</td>
<td>12.444</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>101.582</td>
<td>144</td>
<td>.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>145.473</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Brandimage</strong></td>
<td>44.581</td>
<td>5</td>
<td>8.916</td>
<td>14.708</td>
<td>.000</td>
</tr>
<tr>
<td>Between Groups</td>
<td>87.293</td>
<td>144</td>
<td>.606</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>131.873</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quantity</strong></td>
<td>13.263</td>
<td>5</td>
<td>2.653</td>
<td>3.286</td>
<td>.008</td>
</tr>
<tr>
<td>Between Groups</td>
<td>116.230</td>
<td>144</td>
<td>.807</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>129.493</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ANOVA Interpretation:

From the ANOVA table it can be stipulated that there is a significant difference in attributes such as Price, Quality, Brand Image, and Quantity for different brands of fairness cream with (p value < 0.05).

Table 2 SUBSETS OF ANOVA ON PRICE

<table>
<thead>
<tr>
<th>Brand of cream</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Maybelline</td>
<td>15</td>
<td>3.73</td>
</tr>
<tr>
<td>Patanjali</td>
<td>25</td>
<td>3.76</td>
</tr>
<tr>
<td>Garnier</td>
<td>30</td>
<td>3.87</td>
</tr>
<tr>
<td>L’Oreal</td>
<td>26</td>
<td>3.92</td>
</tr>
<tr>
<td>Himalya</td>
<td>26</td>
<td>4.08 4.08</td>
</tr>
<tr>
<td>Fair and Lovely</td>
<td>28</td>
<td>4.36</td>
</tr>
</tbody>
</table>

Interpretation

From the above table it can be stipulated that the fair and lovely brand has the highest preference and the Maybelline brand has the lowest preference in terms of price attribute.
Table:3 SUBSETS OF ANOVA ON QUALITY

<table>
<thead>
<tr>
<th>Brand of cream</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Maybelline</td>
<td>15</td>
<td>3.13</td>
</tr>
<tr>
<td>Fair and Lovely</td>
<td>26</td>
<td>3.38</td>
</tr>
<tr>
<td>Patanjali</td>
<td>25</td>
<td>3.44</td>
</tr>
<tr>
<td>Garnier</td>
<td>30</td>
<td>3.83</td>
</tr>
<tr>
<td>Himalya</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>L’Oréal</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation

From the above table it can be stipulated that the L’Oréal brand has the highest preference and the Maybelline brand has the lowest preference in terms of Quality aspect.

Table:4 SUBSETS OF ANOVA ON BRAND IMAGE

<table>
<thead>
<tr>
<th>Brand of cream</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Patanjali</td>
<td>25</td>
<td>2.84</td>
</tr>
<tr>
<td>Garnier</td>
<td>30</td>
<td>3.40</td>
</tr>
<tr>
<td>Fair and Lovely</td>
<td>26</td>
<td>3.69</td>
</tr>
<tr>
<td>Maybelline</td>
<td>15</td>
<td>3.93</td>
</tr>
<tr>
<td>Himalya</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>L’Oréal</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation

From the above table it can be stipulated that the L’Oréal brand has the highest preference and the Patanjali brand has the lowest preference in terms of Brand Image aspect.

Table:5 SUBSETS OF ANOVA ON QUANTITY

<table>
<thead>
<tr>
<th>Brand of cream</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Patanjali</td>
<td>25</td>
<td>3.28</td>
</tr>
<tr>
<td>Fair and Lovely</td>
<td>26</td>
<td>3.73</td>
</tr>
<tr>
<td>Garnier</td>
<td>30</td>
<td>3.73</td>
</tr>
<tr>
<td>Maybelline</td>
<td>15</td>
<td>4.07</td>
</tr>
<tr>
<td>L’Oréal</td>
<td>26</td>
<td>4.08</td>
</tr>
<tr>
<td>Himalya</td>
<td>28</td>
<td>4.14</td>
</tr>
</tbody>
</table>

Interpretation

From the above table it can be stipulated that the Himalya brand has the highest preference and the Patanjali brand has the lowest preference in terms of Quantity aspect.
Table 6 REGRESSION

<table>
<thead>
<tr>
<th>Model B</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>.171</td>
<td>.530</td>
<td></td>
<td>.322</td>
</tr>
<tr>
<td>Quality</td>
<td>.415</td>
<td>.075</td>
<td>.353</td>
<td>5.534</td>
</tr>
<tr>
<td>Price</td>
<td>.468</td>
<td>.072</td>
<td>.415</td>
<td>6.467</td>
</tr>
<tr>
<td>Brand image</td>
<td>.183</td>
<td>.072</td>
<td>.179</td>
<td>2.748</td>
</tr>
<tr>
<td>Promo offers</td>
<td>.004</td>
<td>.070</td>
<td>.003</td>
<td>.054</td>
</tr>
<tr>
<td>Advertisement</td>
<td>-.124</td>
<td>.198</td>
<td>-.038</td>
<td>-.630</td>
</tr>
</tbody>
</table>

**Interpretation:**

H1: Quality will have a significant relationship towards consumer buying behaviour on fairness cream.

Here p=0.000

Here p is less than 0.05 so we reject null hypothesis and we accept alternative hypothesis.

H2: Price will have a significant relationship towards consumer buying behaviour on fairness cream.

Here p=0.000

Here p value is less than 0.05 so we reject null hypothesis and we accept alternative hypothesis.

H3: Brand image will have a significant relationship towards consumer buying behaviour on fairness cream.

Here p=0.007

Here p value is greater than 0.05 so we reject alternative hypothesis and we accept null hypothesis.

H4: Promo offers will not have significant relationship towards consumer buying behaviour on fairness cream.

Here p=0.957

Here p value is greater than 0.05 so we reject alternative hypothesis and we accept null hypothesis.

H5: Advertisement will not have significant relationship towards consumer buying behaviour on fairness cream

Here p=0.530

Here p value is greater than 0.05 so we reject alternative hypothesis and we accept null hypothesis.

**FINDINGS**

The increase in number of working women who are conscious about their looks is a big reason for the growth.

Price, quality, brand Image, quantity, fairness is having the much more weightage among the attributes and are much influencing the behavior of the Consumers to take the purchase decision.

The strong growth in the demand and success of new players in the market has prompted existing players to venture into cross categorization.

Multinational companies will compete effectively in Specialty Products such as sun-protection and antistress cream, where a higher price may be justified in the consumer’s mind due to the specific value addition.

The lotion category is the new and emerging area which is slowly replacing creams. Lotions include moisturizing toners, astringent item till recently a small market., but companies are focusing their efforts to project its value into the mind of the customer.

**SUGGESTIONS**

Many fairness cream entered into the market with USP and are ensuring that the skin will become glow. According to my knowledge “Brand” means promise and at any cost of time it must become true when come to reality. Some brands are confined to make promises
and over exaggerate that the skin gets charm within weeks. There is a scope for the companies if they rely on WOMM concept (use, experience & recommend through mouth marketing) through personal touch strong emotional bond could be established between the brand and to the customer rather than to relying on brand ambassador voice. It’s a universal problem everybody is facing and required to protect themselves from pollution and UV rays. So it is the responsibility of the company to think from customer end and produce the lotion or creams with affordable price, there by both could get benefited from four dimensions. 1. CSR 2. unmet social problems 3. Cross selling opportunities for the company 4. Grab significant market share and enhance customer base. If the company think in empathetic way to produce the product with less cost as recommended it can have a page in the history

CONCLUSION

The potential demand for fairness creams will be increased in future due to the ever control pollution and depletion of ozone, changing life styles. As most of the Indians are very much bothered about their color complexion the fairness creams enjoy very good market growth rate when compared with other related product categories. It is not sufficient if a company has the right product with right quality. It has to be communicated properly to the target audience. Usage, price is not matter whether the product is having the ability to meet the requirements of customer.

Ethical Clearance- Not Applicable

Source of Funding - Self

Conflict of Interest - Nil

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Bicondylar Tibial Fractures: Comparison of Single Lateral Locked Plate and Double Incision Dual Plate Osteosynthesis

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ABSTRACT

Over the years, the incidence of high velocity tibial plateau fractures has increased mainly due to increase in motor vehicle accidents, sports related injuries and falls. Currently there are different surgical treatment options available for treating these high energy tibial plateau fractures. However no single treatment method has proven to be uniformly successful. This was a prospective study comparing two groups, one treated by single lateral locked plating (SLLP) and the other by double incision dual plating (DIDP) and followed for a period of 1 year. All fractures in both groups united. There was higher average operating time and radiation exposure in DIDP group. Incidence of soft tissue complications were higher in DIDP group. Incidence of loss of reduction and alignment were higher in SLLP group. Functional outcome at the end of one year follow-up was better in DIDP group.

Keywords: Tibial bicondylar fractures, single vs double.

INTRODUCTION

Tibial condyle fractures are one of the commonest intraarticular fractures comprising of 1% of all fractures and 8% of the fractures in elderly¹. Over the years, the incidence of high velocity tibial plateau fractures has increased mainly due to increase in motor vehicle accidents, sports related injuries and falls. The aim of the surgical treatment of these fractures is to restore and preserve functional, pain free range of movements in the knee by accurate anatomical restoration of the articular surfaces of the tibial condyles.

Currently there are different surgical treatment options available for treating these high energy tibial plateau fractures. However no single treatment method has proven to be uniformly successful. There is still a controversy in selecting the type of surgical treatment, with some recommending single incision and unilateral locked plate on the lateral side²,³ and others recommending two separate incision with dual medial and lateral plating⁴. Each of these methods are having their own advantages and complications. ²,³,⁵,⁶

Horwitz et al.⁷ found that double plating with either a dual buttress construct or a buttress/medial antiglide construct has significantly higher stability than an isolated lateral buttress plate. However, osteosynthesis is dependent on the balance between achieving rigid fixation and preservation of the local biological environment and this balance may be compromised with dual plating (DP).⁸

The purpose of this study was to compare clinical, radiological results and complication rates in single lateral locked plate vs double incision dual plating approaches.

MATERIAL AND METHOD

This study was conducted in Father Muller Medical College and Hospitals between September 2013 to
August 2015. Institutional ethical committee clearance was taken for this study. This was a prospective study. Inclusion criteria included patients presenting with Schatzker’s Type 5 and Type 6 tibial condyle fractures. Exclusion criteria included polytrauma patients, type 3a, 3b & 3c open fractures, patients with severe comorbidities, patients who could not be operated within 15 days after initial injury. This was a surgeon specific cohort study, with one group of doctors doing single lateral locked plate and the other group doing double incision and dual plating.

Surgical technique of single lateral locked plating (SLLP): Patient was placed in supine position on a radiolucent table. Procedure was carried out under Tourniquet. Fracture was opened using a lateral submeniscal approach. Fracture fragments were reduced, depressed fragments were elevated and temporarily fixed with k wires under image intensifier control. Metaphyseal defects were filled with cortico cancellous bone graft from iliac crest. Final fixation was with lateral locked plate which can accommodate 6.5 mm locking cancellous screws and 4.9 mm locking screws. Tourniquet was deflated and hemostasis achieved. Wound was closed in layers (Figure 1).

Surgical technique of double incision dual plating (DIDL): Patient was placed in supine position on a radiolucent table. Procedure was carried out under Tourniquet. First, medial condyle was approached with a posteromedial approach and fragments reduced and fixed with 3.5 mm buttress plate on the posteromedial surface. Then lateral submeniscal approach was used to reduce lateral condyle fragments, elevate the depressed fragments and then fixed with a lateral locking plate similar to SLLP group. Metaphyseal defects were filled up with cortico-cancellous bone graft. Tourniquet was released, hemostasis was achieved and wound was closed in layers (Figure 2).

Same post operative protocol was used in both the groups. Knee range of movements were started after 3 weeks. Partial weight bearing was started from 6 weeks and full weight bearing was allowed after radiological union. Patients were examined clinically and radiologically at the end of 1 month, 3 months, 6 months and 1 year by the first author.

Informed consent was taken from all the patients before enrollment in the study. There were 14 patients in SLLP group, out of which 2 were lost to follow-up. There were 16 patients in DIDL plate, one of whom was lost to follow up. Statistical analysis was done using unpaired t test and Mann Whitney tests and p value <0.05 was taken as statistically significant.

Table 1 : Comparison of variables between SLLP and DIDL groups.

<table>
<thead>
<tr>
<th></th>
<th>SLLP</th>
<th>DIDL</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>12</td>
<td>15</td>
<td>0.312</td>
</tr>
<tr>
<td>Average age</td>
<td>34 years</td>
<td>40 years</td>
<td>0.162</td>
</tr>
<tr>
<td>Male:Female</td>
<td>4:1</td>
<td>4:1</td>
<td>0.81</td>
</tr>
<tr>
<td>Time since injury</td>
<td>8 days</td>
<td>10 days</td>
<td>0.45</td>
</tr>
<tr>
<td>Average operative time</td>
<td>87 mins</td>
<td>130 mins</td>
<td>0.02</td>
</tr>
<tr>
<td>Average image intensifier usage</td>
<td>3.8 mins</td>
<td>6.5 mins</td>
<td>0.03</td>
</tr>
<tr>
<td>Average time for radiological union</td>
<td>22 weeks</td>
<td>20 weeks</td>
<td>0.47</td>
</tr>
<tr>
<td>Superficial infection</td>
<td>1</td>
<td>2</td>
<td>0.08</td>
</tr>
<tr>
<td>Deep infection</td>
<td>0</td>
<td>2</td>
<td>0.03</td>
</tr>
<tr>
<td>Loss of reduction and alignment</td>
<td>2</td>
<td>0</td>
<td>0.02</td>
</tr>
<tr>
<td>Average functional score after 1 year followup (HSS Score)</td>
<td>61</td>
<td>79</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Figure 1: Bicondylar fracture treated by SLLP.

Figure 2: Bicondylar fracture treated by DIDL.
RESULTs

There were 12 patients in SLLP group and 15 patients in DIDP group who completed minimum of 1 year of follow up. Both the groups were comparable in terms of age and sex distribution. Average age in SLLP group was 34 years and 40 in DIDP group. Average time interval between injury to surgery was 8 days in SLLP group and 10 days in DIDP group. Average operative time and radiation exposure was more in DIDP group compared to SLLP group, which was statistically significant. All the fractures united and average time for union was comparable in both the groups. 1 Patient in SLLP group and 2 patients in DIDP group developed superficial wound infection, which were treated by extended antibiotic coverage. 2 patients in DIDP group developed deep infection compared to none in SLLP group, which was statistically significant. These deep infections were treated by multiple debridement and antibiotic beads. One of them resolved completely. Other one required implant removal at 8 months and flap coverage after fracture union. Even though all the fractures united, 2 cases in SLLP group went for loss of alignment and varus collapse compared to none in DIDP group, which was statistically significant. At the end of 1 year follow-up, average functional outcome was better in DIDP group when compared to SLLP group.

DiSCUSSION

The tibial plateau fractures are complex injuries necessitating a restoration of both articular congruity as well as axial alignment of lower extremity and frequently associated with soft tissue injury.

The goals of operative treatment for TPFs were anatomic reduction, especially in restoration of articular congruity, stable fixation for early rehabilitation, and avoidance of complications, particularly infection and non-union.

The treatment of bicondylar fractures is challenging and ideal method still controversial with risk of unsatisfactory results if not treated properly.

In our study even though all the fractures united in both the groups, there were statistically significant differences between some of the variables in them.

Mean operative time and radiation exposure was lower in SLLP group when compared to DIDP group. The single lateral locked plate may theoretically shorten the operating time because of unilateral fixation and use of self-tapping screws. However, reduction of fragments and restoration of alignment for bicondylar fractures through a single lateral incision are technically demanding and this may offset any decreases in operating time during fracture fixation.

There were higher soft tissue complications in DIDP group, compared to SLLP group. This could be related to longer operative time and the need for more dissection in DIDP group. Papers reporting the results of dual plating through a single extensile incision have shown an incidence of deep wound infection of 23–88%. With the two-incision double plating technique, the incidence drops to 4.7–8.4%. With LISS fixation, it is reported to range from 0 to 22%.

There was higher incidence of loss of reduction and alignment in SLLP group when compared to DIDP group. Biomechanically dual plates provide better structural support to both the condyles, thereby preventing collapse.

Barei et al. and Ali et al. reported that single lateral locked plating may not be as effective as dual plating in managing bicondylar tibial plateau fractures. Horvitz et al. found that double plating with either a dual buttress construct or a lateral buttress/medial antiglide construct has significantly higher stability than an isolated lateral buttress plate.

Higgins et al. performed a biomechanical study and concluded that dual-plate fixation allows less subsidence in this bicondylar tibial plateau cadaveric model when compared to isolated locked lateral plates.

Functional outcome assessed using HSS scoring at the end of one year was better in DIDP group. This is directly related to incidence of loss of reduction and alignment in SLLP group, affecting the knee biomechanics. However long term complications like post traumatic arthritis, which has significant bearing on knee function have not been included in this study.

Limitations of this study are less sample size, non randomised groups and medium term followup.

CoNClUsIoNS

We conclude that double incisions dual plate osteosynthesis is better than single lateral locked plating for the management of bicondylar tibial fractures, as far
as maintenance of reduction and alignment and medium term functional outcome are concerned, even though it is associated with higher soft tissue complication rates. However, these findings need to be substantiated with long term studies with bigger samples.

Acknowledgment: Nil

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Institutional Ethical committee clearance taken.

Abbreviations: SLLP: single lateral locked plating
DIDP: double incision dual plating

REFERENCES


Prevalence of Protein Energy Malnutrition among Underfive Children

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ABSTRACT

Objectives: To determine the prevalence of PEM among under five children residing at rural areas of Kutch-Gujarat.

Method: A pilot study conducted among underfive children. Totally 73 were registered and assess to determine the prevalence. In vivo-Bio physiological measuring instructs used for assessment. Measured values are applied on WHO Anthro v.3.22 software to identify the PEM children and

Results: 73 underfive children (50.6%) 34 were identified as a moderate PEM. 37 children were healthy. 2(2.7%) were severe PEM. As per WHO classification z scores based on height for age 45.2% (33) children are Normal height for age,52.1%(38) children were stunted (<-2SD) and 2.7%(2) were severely stunted (< -3SD). Based on weight for age 50.6% (37) were healthy, 46.6% (34) were underweight (<-2SD) and 2.7% (2) severe underweight (< -3SD). As per weight for height 47.9% (35) were healthy, 49.3 % (36) were wasted (< -2SD) and 2.7% (2) were severely wasted (< -2SD). There was a significant association between the prevalence and demographic variables such as education, Type of family, family monthly income and dietary pattern. There was no significant association between the prevalence and demographic variables such as age, occupation, number of under five children in the family and sources of health information.

Conclusion: The higher prevalence of PEM was found among under five children in rural areas of Kutch.

Keywords: Prevalence, Protein Energy Malnutrition, Under five children, Rural area.

INTRODUCTION

Food is an important and basic biological need of man. It is essential for life, growth, repair of the human body, regulation of body mechanisms and production of energy for work. Nutrition plays the most important part in growth. Nutritional deficiency disorders are major public health problem in India and other developing countries. Protein Energy malnutrition also a part in that. It is not only an important cause of childhood morbidity and mortality but leads to permanent impairment of physical and possible of mental growth of those who survive.

The current concept of protein energy malnutrition is that of clinical forms- Kwashiorkor and Marasmus Kwashiorkor and Nutritional Marasmus are two extreme forms of PEM. Kwashiorkor is due to deficient intake of both protein and calories but protein lack is more predominant. Marasmus is due to deficiency of both proteins and calories inadequacy in diet in the recent past with predominant lack of calorie. There is limited data on prevalence of PEM among under five children in the age group of 0-5 years.
The common factors associated with child’s age, sex, area of living, socio economic status of the family, environmental sanitation, mothers education, and mothers age are reported by earlier study. In the light of above facts and from the experience of investigator it is observed that there is need to determine the prevalence of PEM among under five children at rural areas.

MATERIALS AND METHOD

A pilot study was conducted among underfive children to determine the prevalence of PEM. Non experimental Survey research design was used in this study. The study was conducted at selected rural areas of Bhuj-Kutch. Population of the study was underfive children. Rural Anganwadies were used as a sampling frame. Simple random sampling technique used to select the samples. The prevalence of PEM was classified according to WHO classification. As per WHO classification they were classified as Normal, Moderate PEM, and Severe PEM. As per height for age, weight for age and weight for height children were classified as Stunted, Underweight and wasting respectively.

The inclusion criteria adopted was: i) children age group 0-5 years those who were not completed five years. ii) Both male and female children were included. iii) underfive children who were willing to participated. The exclusion criteria adopted was: i) children who were not attended anganwadies at the time of assessment. ii) Children who were above 5 years. iii) Urban children were excluded.

All subjects were examine by In vivo Bio physiological measuring instruments such as weighing machine, inch tape, Infanto meter and Shakir’s tape were used to measure the height, weight, Midarm circumference, head circumference, and general clinical examination was done to each child. The Obtained values were applied on WHO Anthro v.3.2.2 software to identify the PEM children.

All identified PEM children were assessed for clinical features associated with PEM. It includes hair changes, skin changes Respiratory infections.GI symptoms and CNS features. All collected quantitative data was expressed in frequency and percentage.

Table 1: Frequency distribution and percentage of prevalence of Protein Energy Malnutrition among under five children.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>No. of child as per registered</th>
<th>No. of children attended &amp; assessed</th>
<th>Prevalence of PEM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Healthy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moderate PEM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Severe PEM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>1</td>
<td>191</td>
<td>73</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 2: Distribution of Frequency and percentage of samples according to the prevalence of Stunted under five children based on height for age.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Prevalence of stunted under five children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of children assessed</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>1</td>
<td>73</td>
</tr>
</tbody>
</table>
Table 3 Distribution of Frequency and percentage of samples according to the prevalence of underweight among under five children based on Weight for age. N=73

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Prevalence of underweight among under five children</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of children assessed</td>
<td>No. of children found normal weight for age</td>
</tr>
<tr>
<td>1</td>
<td>F 100 % 73</td>
<td>37 50.6 34</td>
</tr>
</tbody>
</table>

Table 4: Distribution of Frequency and percentage of samples according to the prevalence of wasting among under five children based on Weight for height. N=73

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Prevalence of Wasting among under five children</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of children assessed</td>
<td>No. of children found normal weight for height</td>
</tr>
<tr>
<td>1</td>
<td>F 100 % 73</td>
<td>35 47.9 36</td>
</tr>
</tbody>
</table>

**Results**

A total of 118 children were registered with selected two rural anganwadies of Bhuj-Kutch. Among them 73 children were attended and all were assessed to identify the prevalence of PEM. According to WHO classification 50.6 % (37) children were found Normal, 46.7 % (34) were moderate PEM and 2.7 % (2) were found severe PEM. Based on height for age 45.2% (33) children were found normal, 52.1% (38) were stunted (<-2SD), where as 2.7% (2) were severely stunted (<-3SD). As per weight for age 50.6% (37) children were found normal, 46.6% (37) were under weight (<-2SD), where as 2.7% (2) were severely under weight (<-3SD). According to weight for height 47.9% (35) children were found normal, 49.3% (36) were wasted (<-2SD), and where as 2.7% (2) were severely wasted (<-3SD). The results of general clinical examinations performed among 36 PEM identified underfive children shows 41.6 % (15) were having symptoms of hair changes, 36.1% (13) were having symptoms of skin changes, 58.3 % (21) were reported respiratory symptoms like cold and cough, 63.8% (23) were reported GI symptoms such as vomiting, diarrhea, crave for food and loss of appetite. And 52.7% (19) were looked like lethargy and dull.

There was a significant association between the prevalence and demographic variables such as education, Type of family, family monthly income and dietary pattern. There was no significant association between the prevalence and demographic variables such as age, occupation, number of under five children in the family and sources of health information.

**Discussion:**

In the present study 46.7 % (34) were moderate PEM and 2.7 % (2) were found severe PEM. A similar study was conducted earlier among under five children at Salem, Tamilnadu, reported prevalence of PEM 29% moderate PEM and 36% severe PEM. Another study conducted in India also reported similar results. It was found that 69.87% in the age group of 3-6 years as compared to other age group.

According to the weight for age higher prevalence of study shows 52.1% (38), children were stunted (<
300
-2SD) where as 2.7% (2) were severely wasted (<-3SD). Similar study have been conducted by National Family Health Survey (NFHS) among under five children at another district of Gujarat, reported 38.5% of the children were stunted.11

The prevalence of underweight among under five children found 46.6% (37) were under weight (<-2SD), where as 2.7% (2) were severely underweight (<-3SD). An earlier study conducted at Haryana district of India reported 41.3% were under weight and 14% were severe under weight.12

The prevalence of rate of wasting among under five children found 49.3% (36) were wasted (<-2SD), and where as 2.7% (2) were severely wasted (<-3SD). The similar study was reported 26.4% children were wasted and 9.5 % were severely wasted.11

Comparing prevalence of PEM with socio economic status of the family, it was found that higher percentage 50% of children were living in low socio economic status. This could be due to low socio economic status might cause parents unable to spend for the child nutrition. An earlier study conducted at Rithora reported the same.10

The higher prevalence of PEM found with the children who were belongs to joint family. It could be due to more number of people in the might be busy with their household activities. Similar results have been reported by earlier studies.10

The prevalence of PEM is assumed to be result of vegetarian food habit. This could be due to they were not getting first class protein which will be sourced by egg, meat, fish and other animal products. Also might be due to less knowledge about kitchen garden. An earlier study also reported the same result.10

CONCLUSION

PEM is complex and major health problem in developing countries like India. Government of India focusing to reduce the PEM and other associated symptoms among under five children. Also awareness of Prevention of PEM among should be creating among the mothers of under five children.

Compliance with ethical Standards: None

Conflict of Interest : None

Sources of Funding : None

REFERENCES


Analysis of Risk Factors of Personality Type with Hypertension Occurrence of Young Adult

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ABSTRACT

Hypertension is the third leading cause of death in Indonesia. Hypertension occurs when the systolic blood pressure was 140 mmHg and 90 mmHg diastolic. The continuous increase of blood pressure will increase a person’s risk of stroke and coronary heart disease. The personality types is affected the recurrence of hypertension where a person used to coping stress. This research was analytic study with case control study design with non-matching procedure which aims to analyze the risk factors of hypertension based on personality types. The population of this study was all the residents in the working area of Benu-Benua health center, district of Kendari which was 25 105 people. Samples in the study sample divided into 50 cases and 50 control samples. Tests were analyzed using Odds Ratio (OR) at the 95% confidence level. The results shows that the person with personality type A had an OR of 12.571, 95% CI (3.434 to 46.018) after comparing with the personality type B, which means respondents with personality type A have a risk 12.571 times more likely to obtain hypertension rather than person with personality type B, type C personality OR was 2.154, 95% CI (0.562 to 8.253) after comparing with the personality type B, which means respondents with personality type C have a risk 2,154 times more likely to obtain hypertension than personality type B, and person with personality type D the OR was 6.400, 95% CI (1.818 to 22.536) after comparing with the personality type B, which means respondents with type D personality had a risk 6,400 times more likely to obtain hypertension than personality type B. It is suggested for policy maker in order to prevent hypertension by determine the personality of a person personality to be included as a program so early prevention of hypertension can be conducted.

Keywords: Hypertension, personality type A, personality type B, personality type C, personality type D.

INTRODUCTION

Non-communicable diseases are a major cause of death in the world. There were 17 million deaths due to non-communicable diseases and 80% due to cardiovascular disease occurring in lower middle income countries. The highest case of death because of non communicable disease in Asia, one of it was in south east Asia. The data from the WHO shows that hypertension is estimated to cause 7.5 million deaths, or 12.8% of total annual deaths, person who can have hypertension if the systolic blood pressure was 140 mmHg and factors, namely the increase in blood pressure. The increasing a person’s blood pressure will diastolic blood pressure of 90 mmHg. As for the high mortality rates due to the major risk increase the risk of stroke and coronary heart disease¹.

It is estimated that in 2025 in developing countries increased cases of hypertension approximately 80% of the 639 million cases in 2000 to 1.15 milyar². National Health and Nutrition Examination Survey data from 2005-2008 in the United States showed 76.4 million people aged ≥20 years were hypertensive, meaning one in three adults had hypertension and one third were unaware³. Whereas around 40% of deaths at age <65 years stems from high blood pressure. Hypertension is
generally started at a young age, approximately 5-10% occurred in the 20-30 year age. Hypertension is the third leading cause of death in Indonesia for all ages (6.8%), after stroke (15.4%) and tuberculosis (7.5%).

Furthermore, hypertension patients in the city of Kendari in 2012 there were 5778 cases, in 2013 there were 11,615 cases, in 2014 there were 9811 cases, in 2015 there were 13,137 cases. While the Benu-Benua Health Center received the highest hypertension visit in Kendari. In 2013 namely; 1145 cases, in 2014 there were 1,231 cases and 2015 there were 1,929 cases. In addition, the number of cases of hypertension in young adults (18-45 years) is quite high. In 2013 there were 104 cases, 2014 there were 134 cases and 2015 there were 139 cases. Basically Hypertension can also be affected by the type of personality. Personality types affect the recurrence of hypertension as seen from the way a person uses coping stress.

Personality has something much more fundamental issue, which is composed of the aspects which each show a characteristic/specific trait that determines the behavior of an individual. Differences in individual factors affect the behavior and lifestyle. The things are affecting of level or degree hypertensions patients. Personality types affect the recurrence of hypertension as seen from the way a person uses coping stress.

Personality type A has characteristics, as follows: it has a low patience level, in a hurry to do anything, have high expectations for success, and have a high desire to Compete, aggressive and irritable. The personality types B have a tendency of people covered, the high level of patience, work slowly, talking with regular and relaxed, patient and have low competitiveness, have a low desire to Compete, less aggressive, and not Easily angry. Next personality type C is a pleasant person, but stressed, tends to internalize anger and anxiety and difficult, to express emotions. The personality type D is derived from the word “Distressed” roommates is a combination of Negative Affectivity (NA) and the Social Inhibition (SI), personality type D has been reported in various studies related to do with the increase in the incidence of various cardiovascular diseases and Decreased quality of life in These Patients.

**METHOD**

These studies was an Case Control Study. Where the population in this research which is all the residents who are living in Benu-Benua Health Center Working area of Kendari which was 25 098 people. The sample in this study was two cases hypertension and controls who did not suffer from hypertension which was 50 people that obtained using purposive sampling techniques.

**RESULTS**

Univariate Analysis

Personality types affect people’s resistance when in stress. The Complex psychological characteristics of individuals that arise from unique behaviors.

Personality Type Risk Factors with Genesis Age Young Adult Hypertension.

Table 1: Distribution characteristics of individuals

<table>
<thead>
<tr>
<th>No.</th>
<th>Personality Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Personality Type A</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Personality Type B</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Personality Type C</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Personality Type D</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
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<td>100</td>
</tr>
</tbody>
</table>

Analysis of bivariate

The Personality Type Risk Factors with Genesis Age Young Adult Hypertension. The results of the chi-square test analysis.

Table 2: Type Risk Factors with Genesis Age Young Adult Hypertension

<table>
<thead>
<tr>
<th>No.</th>
<th>Personality Type</th>
<th>Hypertension</th>
<th>Amount</th>
<th>Value p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cases</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>Personality Type A</td>
<td>22</td>
<td>44</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Personality Type B</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Personality Type C</td>
<td>7</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Personality Type D</td>
<td>16</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>
Based on the analysis chi-square test personality type A, type B personality, personality type C and type D personality on the incidence of hypertension was obtained \( p = 0.000 \) thus the correlation between personality type with hypertension. So the personality type B used as a comparison to get the value of OR in this study because of the personality type B had a lower risk of incident hypertension. The analysis of personality type risk factors with Genesis Age Young Adult Hypertension.

### Table 3: Type risk factors with Genesis Age Young Adult Hypertension

<table>
<thead>
<tr>
<th>No.</th>
<th>Personality Type</th>
<th>Hypertension</th>
<th>Amount</th>
<th>Value p</th>
<th>OR (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cases</td>
<td>Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Personality Type A</td>
<td>22</td>
<td>44</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Personality Type C</td>
<td>7</td>
<td>14</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Personality Type D</td>
<td>16</td>
<td>32</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>Personality Type B</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>100</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 3 shows that of the 50 respondents case, there are 22 people (44%) with type A personality, 5 (10%) with the personality type B, 7 (14%) with the personality type C and 16 people (32%) with the personality type D while the control group there were 7 people (14%) with the type of personality A, 20 (40%) with the personality type B, 13 patients (26%) with the personality type C and 10 people (20%) with type personality D.

The results of the risk factors analysis of type A personality on the incidence of hypertension was obtained OR of 12.571 after comparing the personality type A and type B personality means that respondents who have the personality type A have the risk of suffering from hypertension 12.571 times greater than the respondents who have a personality type B. because the value range at the 95% confidence level with a CI lower limit and upper limit \( =3.434=46.018 \) does not include the value of one, the greater the risk is considered significant thereby personality type A is a risk factor for hypertension.

The results of the risk factors analysis of personality type C the incidence of hypertension was obtained OR of 2.154 after comparing the personality type C and type B personality means that respondents who have the personality type C have the risk of suffering from hypertension 2.154 times greater than the respondents who have a personality type B. because the value range at the 95% confidence level with a CI lower limit and upper limit \( =0.562=8.253 \) includes grades one, the greater the risk is considered not significant thereby personality type C is not a risk factor for hypertension.

The results of the risk factors analysis of type D personality on the incidence of hypertension was obtained OR of 6.400 after comparing between type D personality and personality type B. means that respondents who have type D personality had developed hypertension risk 6.400 times greater than the respondents who have a personality type B. because the value range at the 95% confidence level with a CI lower limit and upper limit \( =1.818=22.536 \) does not include the value of one, the greater the risk is considered significant and is therefore personality type D is a risk factor for hypertension.
DISCUSSION

The analysis of the risk factors of A type personality on the incidence of hypertension was obtained OR of 12.571 after comparing the personality type A and type B. personality means that respondents who have type A personalities are at risk of suffering from hypertension 12.571 times greater than the respondents who have a personality type B, the value range at 95% confidence level with a CI lower limit =3.434 and the upper limit =46.018 does not include the value of one, the greater the risk is considered significant and is therefore personality type A is a risk factor for hypertension.

According to the results of analysis obtained that from the number of samples in the case group, the majority of patients with hypertension have a type A personality (44%). Based on their characteristics, people with type A personalities are prone to stress. In terms of stress in relation to the incidence of hypertension is one of the factors that influence it. Stress is one of the circumstances in which the emotional as well as physical individuals that arose as a reaction to defend themselves against the interaction of the environment that are considered to endanger or disturb.

There is a relationship between stress factors with the incidence of hypertension. Means allegedly through sympathetic nerves. In increase sympathetic nerve activity can increase blood pressure intetmitten. Stress can trigger an increase in the hormone adrenaline and kartisol, also make people have bad eating habits, and smoking. Conditions such circumstances if not addressed could be a factor of hypertension. Controlling stress have a major impact on the reduction of blood pressure.

The pattern of behavior of type A personality is to have a competitive attitude high, serious in doing the task, the task quickly, always racing against time, can not wait, prone to stress, often in a hurry, aggressive, willing to oppose against the other to get what desideratum, hurry in determining something, assertive, perfectionist, polyphasic, ambitious, and have very high standards for themselves. Individuals with personality type A is a victim of feelings of self-doubt that continuously they force themselves to accomplish more in a short time.

The results of the analysis of the risk factors of personality type C the incidence of hypertension was obtained OR of 2.154 after comparing the personality type C and type B personality means that respondents who have the personality type C have the risk of suffering from hypertension 2,154 times greater than the respondents who have a personality type B. because the value range at the 95% confidence level with a CI lower limit and upper limit =0.562=8.253 includes grades one, the greater the risk is considered not significant thereby personality type C is not a risk factor for hypertension.

Furthermore, personality type C is a pleasant person, but stressed, which tends to suppress their anger and anxiety and difficult to express emotion. Personality type C so that it can suddenly change from happy to sad directly and vice versa. Difficulties they did not assess things at face value and are interested to find out exactly how things worked. Someone with a personality type C may lead to angry quickly, emotionally unstable and difficult to forgive others so that it can cause lead to hypertension. But in this study, although the respondent has the personality type C level of anger always arises quickly, but it apparently did not make the respondent be stress that can trigger a rise in blood pressure, because the respondent was able to control himself so as not easily stressed, so that the increase in blood pressure can resolved.

Based on analysis of personality type C (CI=0.562 to 8.253), included within the scope of the value of 1, it is considered not significant thereby personality type C is not a risk factor for hypertension. It is also due to the presence of more meaningful variables significantly compared with the type C. This was evidenced at the interview directly for a Type C personality fewer categories in the case group ie 7 respondents which means respondents with other more dominant personality type.

The results of the analysis of the risk factors of type D personality on the incidence of hypertension was obtained OR of 6.400 after comparing between type D personality and personality type B. This means that respondents who have type D personality had developed hypertension risk 6,400 times greater than the respondents who have a personality type B. individuals with type D personality is associated with increased levels of the hormone cortisol due to prolonged stress experienced by the individual.

While the type D personality is associated picture as a tendency toward negative affect that worry, irritability, moodiness and social barriers that silence and lack of confidence (Denollet, 2005). Type D individuals with
through experience negative emotions (such as anxiety, sadness, anger) all the time and the situation and remove the emotion of expression in social interaction afraid of how others react.

**CONCLUSION**

Personality type A is a risk factor for hypertension with OR 12.571 or 12.571 times more at risk than the personality type B.

Personality type C is not a risk factor for hypertension with OR 2.154 (CI 0.562-8.253) then it is not considered meaningful.

Personality type D is a risk factor for hypertension with OR 6.400 or 6.400 times more at risk than the personality type B.

**SUGGESTION**

It is expected to recognize the personality type of each person, in order to control or control emotions and factors that could affect efforts to prevent hypertension as early as possible.

It is expected for Health Center and related institutions can improve health promotion efforts, especially the problem of hypertension and the factors that influence it, including personality type and other matters relating to risk factors of hypertension. Giving health promotion is not enough. In addition, the clinic along with other relevant agencies are expected to make efforts to find cases of hypertension (screening), because many people do not know that they were suffering from hypertension.

For further research is expected to continue this research with another design, to know with more certainty how the relationship between personality type and hypertension.

**Ethical Clearance:** The ethical clearance was taken from Faculty committee and community agreement.

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**Conflict of Interest:** Authors declare that there is no any conflict of interest within this research.

**REFERENCES**

The Self-Care Learning Exchange (SCLE) Model: A Model for Promoting Nutrition in Malnourished Children in Indonesia

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1Department of Nursing, University of Muhammadiyah Surabaya, Indonesia

ABSTRACT

Background: The public health problem that developing countries face, including Indonesia, especially Surabaya, is Malnutrition. Aim: This study aims to produce a self-care learning exchange model for families with malnourished children in Surabaya, Indonesia. Method: The study used a research and development approach undertaken in three stages: literature review and field observation, a survey using the Delphi technique to obtain consensus about the model, and a focus group discussion. The research involved a sample of 169 respondents selected by purposive sampling. Data were collected with the help of questionnaires and interviews. Results: The five components of the SCLE model that are important for improving the nutritional needs of malnourished children include planning, implementation, evaluation, timing and indicators of success. Conclusion: SCLE model could be used as a complementary solution to help families overcome the malnutrition problems, by emphasizing the shared learning aspect in the process of transferring knowledge and parenting behaviour.

Keywords: Self-Care, Learning Exchange, Malnutrition, Children, Nursing

INTRODUCTION

Lack of nutrition is a public health problem that is experienced by developing countries, including Indonesia, especially Surabaya. This second largest Indonesian city, after Jakarta, still suffers from malnutrition, as 1.2% of children that are less than five-years-old are malnourished and 12.3% of them lack proper nutrition.

Various efforts have been made by the Surabaya city government, including POSYANDU (a term used for integrated health service centre in Indonesia) activities, counselling, supplementary feeding, home-to-home monitoring, healthy food cooking demonstration, and healthy toddler classes, along with traditional treatment approaches, innovation of Formula 100 (F100) consisting of milk, cooking oil and electrolytes or mineral solutions, and a toddler mentoring program offered to healthy families for 9 months.

In addition, in his research, Ayu declared that nutritional assistance programs can overcome the problem of malnutrition. While Sartika stated that the improvement of nutritional status can be realized through the utilization of health service programs. Moreover, Fitriyanti & Mulyati pointed out that Supplementary Feeding for Recovery (SVR) can restore nutritional status. Huriah et al. mentioned that the nutritional status of children can be enhanced through home care programs.

Without overlooking the above findings, a complementary solution to help families overcome malnutrition problems is to find a model appropriate for dealing with the main cause of child malnutrition, which is wrongful care. This model is the model of learning self-care for malnourished children. The model is oriented towards self-reliance of the families with malnourished children, so that they are able to practice self-care properly. The model begins with assessment, followed by planning learning needs, implementation, and lastly, evaluation of the learning process. The

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purpose of this study is to explain how the self-care learning exchange model with help alleviate the issue of child malnourishment which results from erroneous care.

METHOD

This study used three stages of model development: Stage 1, where the model was initially designed after conducting literature review and field observation; Stage 2, in which a survey was conducted by Delphi technique; and Stage 3, where a focus group discussion was held with experts. This last activity included validating the model design by conducting a focus group discussion to determine the feasibility of the model system to be applied, of the study’s focus and the model framework.

Stage 1: Creating an Initial Model Design

To make the initial model design, literature study and field observation were conducted to devise a survey involving 60 respondents selected by simple random sampling. The sample inclusion criteria were families (mothers) who have malnourished children and are willing to participate in research on the need for a self-care learning exchange model. The survey used a questionnaire with 25 question items divided into five categories, comprising the need for self-care learning exchange planning, implementation of self-care learning, self-care exchange evaluation, self-care learning exchange time, and indicators of effective self-care exchange for children with malnutrition. Each question concerning the need for a self-care learning exchange model consisted of two choices, namely, how likely can the model be applied, and how important is it to apply the model, using the Likert scale of 1 to 5, with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Assessment of questions was done by calculating the mean and standard deviation of each question in the five categories. The average value that correlated to the necessity of a model was more than 4.

Stage 2: Conducting a Survey with the Delphi Technique

A survey on the need for a model was undertaken by involving 10 experts from various disciplines selected by simple random sampling. These experts analysed and reviewed the topic from a scientist’s perspective, which helped in obtaining information and responses as a reinforcement of the development and feasibility of the self-care learning exchange model.

Stage 3: Conducting a Focus Group Discussion

A focus group discussion was held to conduct a feasibility examination of the developed self-care learning model. The focus group consisted of the respondent families (mothers) who would apply the self-care learning exchange model, and a panel of 10 experts involved in providing model feasibility analysis through the Delphi technique.

RESULTS

The results of this study indicate that there is a need for an exchange model in learning self-care for malnourished children aged less than five years in Surabaya. According to the findings, the model should include self-care need without assistance (80%), self-care need with brainstorming (85%), the need for a learning contract with learning resources (mothers with the same case) (85%), the need to formulate self-care learning materials together with discussion (75%), the need to utilize available media such as pictures (90%), direct learning needs in mothers with similar cases (85%), the need for evaluation of self-care group learning (90%), and the need for self-care study once a week for a month. The results are shown in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Results of the Delphi Survey</th>
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</thead>
<tbody>
<tr>
<td>Need for self-care learning exchange</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Self-Care Learning Exchange Planning</td>
</tr>
</tbody>
</table>
Learning Contract
Formulation of self-care learning materials
Media and learning tools.
The self-care learning exchange is designed together (in a group) through brainstorming/discussion and by asking health workers (nurse assistants) directly.

<table>
<thead>
<tr>
<th>Rating</th>
<th>4.62</th>
<th>4.60</th>
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<td>0.24</td>
<td>0.21</td>
<td>0.52</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Implementation of self-care learning
Self-care learning exchange evaluation

<table>
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<th>Rating</th>
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<th>4.70</th>
<th>4.70</th>
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</tr>
<tr>
<td></td>
<td>0.22</td>
<td>0.26</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Based on Table 1, the exchange model in learning self-care for less-nourished toddlers by the family (mother) in Surabaya, especially in undernourished areas identified in this research, can be realized through three stages: planning, implementation and evaluation as follows:

The planning stage is to project what should be done in the implementation phase. This planning stage includes the identification of the self-care learning needs of malnourished children, the self-care learning contract of malnourished children, the formulation of learning materials on the self-care of malnourished children, and choosing media and learning tools on the self-care of children suffering from malnutrition.

In the implementation stage, the plans are actuated, in that, mothers of toddlers learn together with mothers of children under five who lack nutrition. Implementation begins with guidance about intimacy, followed by exchanging learning experience from group learning organizations and application of learning techniques, such as brainstorming, roundtable discussion, direct practice, questions and answers, and simulation. For this stage, the average mother wants the activity to be held one time a week for one month.

In the evaluation stage, the activities are evaluated altogether either through a test or non-test, both practically and orally. In the application of self-care learning exchange, more emphasis is given on form and type of evaluation that is based on the mother’s involvement and learning resources.

**DISCUSSION**

Results of the study showed that the exchange model of self-care learning is most needed in malnourished families. This is in line with Mulyana’s findings whose principle in learning exchange is based on the attitude that changes learning approaches. In this principle, the learning process stresses more on group dynamics, whereas according to Bandura, there are three approaches in the learning process: confidence-oriented approach, feeling-oriented approach and behaviour-oriented approach.

In a confidence-oriented approach, it is assumed that a person can change his or her attachment to an object by conveying new information. The concept of learning exchange in nursing is derived from the concept of learning exchange which denotes a systematic and deliberate effort to create conditions for learning activities to occur. Learning exchange can be understood through the theory of interaction. Which emphasizes that two or more people are interdependent in achieving positive results and functions, not only in the interest of the individual but also in the interest of the group.

Furthermore, the concept of learning exchange contains several principles, such as the humanist principle and principle of attitude learning, both of which are very appropriate to practice in family nursing services because health problems are very much caused by behavioural factors. As stated by Mulyana. The principle of humanist learning is based on a flow that emphasizes the importance of cognitive and affective objectives. From this principle, the efforts to increase knowledge about self-care, especially for children from undernourished families, are indispensable, because in the humanist school, targets are active actors formulating a transactional strategy with their environment.

Another principle of learning exchange is based on the attitude-change learning approach, which has three orientations: the orientation of belief, the orientation of feeling and the orientation of behaviour. These orientations suggest that a person can alter his or her...
attitude if his or her beliefs, feelings and behaviour are modified beforehand. The three approaches are derived from the model of cognitive consistency, which includes the balance theory, the harmony theory and the non-conformity theory. According to the balance theory, balance is needed in the affective domain between an individual and its environment, particularly when there is an imbalance that can change attitudes and behaviour. Similarly, the harmony theory, developed by Osgood and Tannenbaum, underscores the harmony of relationships, and thus shows that disharmony in one's relationship will change attitude. Meanwhile, the basis of the last theory is the theory by Festinger, which emphasizes that discrepancies are undesirable because individuals have two opposing cognitions, and that, by changing the opposing cognition, one can create the desired situation.

Based on the self-care theory, the theory of nursing and learning can be used in nursing service as a form of health service for humans that have a biopsychosocial and spiritual needs by using a nursing process approach. Likewise, the self-care and exchange model can be applied in family nursing practices so as to minimize the number of families who have malnourished children.

The nutritional benefits through the application of a self-care learning exchange model can improve the behaviour in malnourished child care. This is supported by the research by Adrian & Kartika, who stated that inadequate care conditions, such as improper feeding from infant to toddler stage, can cause toddlers to frequently suffer from illness due to digestive disruptions. Conditions of prolonged pain can also cause rapid weight loss and make it easier for infants to become malnourished. In addition, the pattern of care in early and exclusive breastfeeding cases, as well as inappropriate consumption of breastfeeding supplements and poor upbringing, can cause children to get fewer intakes of nutritious, varied, and balanced foods, which can lead to malnutrition. Meanwhile, Palombarini AF found that nutritional interventions through daily dietary practices in families can help overcome nutritional problems. This was corroborated by the study by Frota MA, wherein the researcher found that dietary habits and breastfeeding at the age of 0-6 months contribute to child nourishment. Another study supporting the results of this study is that by Ayu, which noticed improvements in the pattern of upbringing before and after the mentoring program in families with less nutrition. The results showed a significant change in parenting pattern after three months with nutritional assistance. The improvement in childcare practices, especially at the end of nutritional assistance, is closely linked to the improvement of maternal knowledge that plays a dominant role in childcare. It is also correlated with the energy adequacy level in infants with less protein energy, which increased in three months after nutritional assistance, along with their level of protein adequacy. The study shows that nutritional assistance programs have a meaningful effect on improving knowledge and parenting patterns, especially in child feeding practices, which, in turn, will affect the quality and quantity of child feeding. Intervention in the study is in line with the core application of the self-care learning exchange model, which is adopting the way of caring, especially in the practice of malnourished child care by mothers who have successfully cared for children, and from whom aware mothers who have malnourished children can learn directly. Likewise, Hayakawa LY revealed that group support strategies can address the problem of boredom in care.

CONCLUSION

The self-care learning exchange model for malnourished children in Surabaya is a care-oriented model of behavioural change, and includes with three stages: planning, implementation, and evaluation. The planning stage was carried out by the mothers of toddlers collectively by planning the need for self-care learning. Then, the implementation phase was carried out by the under-five toddlers’ mothers based on what had been planned in the prior stage, ranging from group learning organizations to application of instructional techniques, such as brainstorming, roundtable discussion, direct practice, questions and answers, and simulation. The evaluation phase, which was implemented after a month of learning exchanges, determined the level of understanding and practice in the care of undernourished children, with the direct involvement of learning resources. The model is able to improve child care practices and nutritional status within three months, so that the model can help overcome the nutritional problems and the causes of malnutrition due to parenting practices.

The suggestion that could be given based on this study is that nurses working in Community Health Centres could facilitate families (mothers) with children...
that suffer from malnutrition due to wrongful parenting practices, by applying the self-care learning exchange model. This can be used as a complementary approach model for helping families overcome the problem of malnutrition.

**Ethical Approval:** This study was approved by the Health Research Ethics Committee (HREC) of the Faculty of Health Science University of Muhammadiyah Surabaya (Approval Letter Ref: 07/FIK/EC/2016 dated 23 July 2017).

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**Conflict of Interest:** The authors confirm that this article contains no conflict of interest.

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The Development of Islamic Caring Model to Improve Psycho-Spiritual Comfort of Coronary Disease Patients

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ABSTRACT

Objectives: Caring is the essence of the nursing process delivered by nurses in diverse cultural settings exceptionally is Islamic caring. This research aims to develop an Islamic caring model for the psychospiritual comfort of coronary disease patients.

Method: The research method used was analytic observational with a cross-sectional design. This research recruited 70 clients from the population of the heart disease patients in three Islamic hospitals by using simple random sampling. Data were collected by questionnaire and analyzed by Partial Least Squares-Structural Equation Modeling (PLS-SEM).

Results: The research showed that there were influences from the nursing and service factors towards Islamic caring with a value of $t= 7.79$; $2.06$. There was influence from Islamic caring towards psychospiritual comfort with a value of $t= 2.85$.

Conclusions: The Islamic caring model is a nurse’s behavior that emphasizes Islamic values that include the characteristics of maintaining confidence, compassion, and competence to enhance the patients’ psychospiritual comfort.

Keywords: Coronary disease; Caring; Islam; Psychology; Spirituality.

INTRODUCTION

There has been an increase in the number of coronary disease cases, and it has been shown that the disease often has a big impact on the individual, one of which is anxiety (1). This anxiety issue was also experienced by the coronary disease patients at General Hospital, who became the subjects of this research (2). Patients with moderate anxiety have a 2.3% longer hospitalization period than patients without anxiety or with only mild anxiety (3). Anxiety that is not treated properly can increase the risk of a heart attack that ranges from non-fatal to fatal (4). Research also shows that spirituality or religious behaviors are very helpful in the process of reducing anxiety (5). This spirituality or religious behavior needs to be adjusted to the patients’ culture and religion (6), (7).

Religious-based hospitals, especially those of an Islamic background, have become an alternative medical treatment for Indonesian people. These hospitals are characterized by their Islamic caring principles using spiritual approaches. Islamic caring is caring using the principles of Islam, which are excellence or perfection, always being professional, and always guiding towards kindness in worship and in daily life (8), (9). Caring is the essence of nursing as both a science and art in treating patients (10). Islamic caring is the professional attitude of nurses towards patients, their families, and society, characterized by care, kindness, empathy,
polite therapeutic communication, and responsiveness. They should always give the best service based on the Holy Quran and the acts and sayings of the Prophet Muhammad \(^{(1)}\). The development of Islamic caring in the available literature remains unclear. There is a need for more in-depth studies that focus on these Islamic caring variables and for the development of an Islamic caring model for the psycho-spiritual comfort of coronary disease patients.

**MATERIAL AND METHOD**

*Study design*

The research design involved observational analytics with a cross-sectional design to develop an Islamic caring model for the psycho-spiritual comfort of coronary disease patients including the nurse factor and service factor.

*Sample and setting*

The population of this research were the coronary disease patients being treated in the wards at three Islamic Hospitals in East Java Province of Indonesia. The sample of 70 patients was chosen by simple random sampling. The data collection was adjusted with the criteria of uncomplicated arrhythmias and not being under or in any emergency situation.

*Instruments*

Patients’ background characteristics included age, gender, occupation, health insurance, and formal and non-formal education. The variables of Islamic caring covered the aspects of the nurses themselves, services, patients, Islamic caring, and psycho-spiritual comfort. The variables that form Islamic caring were measured using a questionnaire. The questions were modified by Abdurrouf \(^{(1)}\) and Sudalhar \(^{(9)}\). The validity and reliability tests on the questionnaire showed a coefficient score from .30 to .92, and Cronbach’s alpha was from .91 to .98.

*Data analysis*

Data were analyzed using frequency and percentages. The data analysis was conducted using Partial Least Squares-Structural Equation Modeling (PLS-SEM) multi-variant statistics.

*Ethical consideration*

The study procedures were reviewed and approved by the Ethics Committees on July 11, 2016, decision letter number 425-KEPK. Due to ethical clearance of this study, participants were given information and filled in informed consent before the study.

**FINDINGS**

The results of the data collection showed that the characteristics of the research subjects are as follows (Table 1). The research subjects were categorized as elderly patients, age 56-64 years old; most of them were male. Their occupations were mostly in the private sector, or as laborers workers. The health insurance for most of them was provided by the National Healthcare and Social Security Agency (BPJS) or National Health Insurance (Askes). Their formal education was mostly of elementary school level. Lastly, most of them had never attended Islamic non-formal education.

**Table 1 Sample Characteristics (N=70)**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>26-35 years old</td>
<td>4 (5.7)</td>
</tr>
<tr>
<td>36-45 years old</td>
<td>2 (2.9)</td>
</tr>
<tr>
<td>46-55 years old</td>
<td>17 (24.3)</td>
</tr>
<tr>
<td>56-64 years old</td>
<td>25 (35.7)</td>
</tr>
<tr>
<td>&gt;65 years old</td>
<td>22 (31.4)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39 (55.7)</td>
</tr>
<tr>
<td>Female</td>
<td>31 (44.3)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Not working</td>
<td>3 (4.3)</td>
</tr>
<tr>
<td>Housewives</td>
<td>22 (31.4)</td>
</tr>
<tr>
<td>Private company workers/Laborer workers</td>
<td>36 (51.4)</td>
</tr>
<tr>
<td>Govt employee/Armed forces/Policeman</td>
<td>9 (12.9)</td>
</tr>
<tr>
<td>Retired armed forces or police</td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td></td>
</tr>
<tr>
<td>SKTM (for the underprivileged)</td>
<td>13 (18.6)</td>
</tr>
<tr>
<td>BPJS/Askes (Govt national insurance schemes)</td>
<td>46 (65.7)</td>
</tr>
<tr>
<td>Mandiri (Own costs)</td>
<td>11 (15.7)</td>
</tr>
<tr>
<td>Formal Education</td>
<td></td>
</tr>
<tr>
<td>Elementary school</td>
<td>32 (45.7)</td>
</tr>
<tr>
<td>Junior high school</td>
<td>14 (20.0)</td>
</tr>
<tr>
<td>Senior high school</td>
<td>15 (21.4)</td>
</tr>
<tr>
<td>Diploma</td>
<td>1 (1.4)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>8 (11.4)</td>
</tr>
</tbody>
</table>
Cont.. Table 1 Sample Characteristics (N=70)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Formal Education</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>53 (75.7)</td>
</tr>
<tr>
<td>Islamic learning in mosque/from media</td>
<td>14 (20.0)</td>
</tr>
<tr>
<td>Islamic boarding school</td>
<td>3 (4.3)</td>
</tr>
</tbody>
</table>

Discussion

The Islamic Caring Model

The new finding of this research is that the Islamic caring model had a direct influence on the psycho-spiritual comfort of coronary disease patients. The Islamic caring model in this research is the development of Caroline Care Model’s emphasis on Islamic values that character of maintaining belief, compassion, and competence. Psycho-spiritual comfort based on Kolcaba’s theory that is modified by using Islamic values has the characteristics of patience, sincerity, and fortunate (12). Islamic caring is a guide for nurses that encourages them to maintain their faith and to be sincere, compassionate, and competent, based on the Holy Quran and Prophet Muhammad’s sayings.

The results of the statistical test showed that a good Islamic caring would significantly associated with a nurse and the hospital service. The results of this research indicate that a nurse’s attitude is influenced by their personal character (13). The research results showed that the hospital service factor significantly influenced the
nurses’ Islamic caring behaviors when performing their services. The service factor in this research could be used as an component for the spiritual service regulations. These results agree with the findings of other studies, in which mentioned that spiritual services should be integrated with the vision, missions, and regulations of the hospital (14).

The behavior of nurses in Islamic caring can improve the psycho-spiritual comfort of coronary heart patients and help patients to display patience, gratitude, and sincerity. The results of this research are in accordance with the theory that says that well-being in an Islamic way is a condition full of being thankful for God’s grace in the physical, spiritual, and social aspects of life (15). Well-being full of thankfulness means that when someone has recovered fully from an illness, he or she has to be thankful and then go on to do good deeds. If they have already recovered but there are still remaining symptoms or disabilities, then he or she is still required to be patient and to surrender to God’s will. If the illness is very serious or if there is no chance for recovery, he or she is obligated to be patient and to trust that God’s plan is the best for him or her (16). Patience, gratitude, and sincere characteristics of patients need to be improved by increasing the patient’s religious knowledge. This situation is in accordance with research that mentions the spiritual can be improved by increasing religious knowledge (2). Patience can also be demonstrated by believing that everything that happens is the destiny of God set in us. A Muslim must be sure that whatever happens to nurse has an element of goodness. Sincerity for the patient means their efforts in pursuing treatment merely seeks the pleasure of Allah and purifies the deeds relating to all pleasures of the world (17). The sincerity of the patient includes all actions and sincere words that show he or she only wishes to please Allah.

The patient’s psycho-spiritual comfort is judged by gratitude for the conditions or experienced and is shown by practicing and exercising God’s command. This clause explains that the painful ordeal that affects the patient is merely a sign of God’s love and affection for God creature. Patients should be grateful to God for every blessing in daily life (18).

Islamic Caring Components

Islamic caring behavior has the characteristic of maintaining faith in Islam, which can also mean excellence or perfection in worshipping. Being excellent for the nurse means that they have to maintain their intention to work sincerely. Sincerity is a strong character and does not recognize exhaustion (being consistent) (17). The description of the theory shows that sincerity is the basic belief on which to build caring behavior of Islamic nurses. If the nurse develops sincerity, it makes the nurse’s work easier. Sincerity as a skill creates the deepest and objectively measurable heartfelt interactions (18). The sincerity character of nurses comes from all habits and actions. Nurses action comes from their mind that drives from themselves feelings. The explanation suggests that maintaining the belief (sincerity) that characterizes the nurse can be recognized as Islamic caring (Table 2). Islamic caring is evidence of the sincerity of a nurse that can be objectively measured.

<table>
<thead>
<tr>
<th>No.</th>
<th>components</th>
<th>(\frac{(X - \text{Min})}{(\text{Mak} - \text{Min})}) x 100%Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maintaining faith (sincerity)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Patience</td>
<td>87,8% Good</td>
</tr>
<tr>
<td></td>
<td>b Gratitude</td>
<td>81,1% Good</td>
</tr>
<tr>
<td></td>
<td>c Consistency</td>
<td>78,9% Good</td>
</tr>
<tr>
<td>2.</td>
<td>Compassion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Wise</td>
<td>76,7% Good</td>
</tr>
<tr>
<td></td>
<td>b Prioritize other people</td>
<td>80% Good</td>
</tr>
<tr>
<td></td>
<td>c Beneficial</td>
<td>70% Enough</td>
</tr>
<tr>
<td></td>
<td>d Well-mannered</td>
<td>81,1% Good</td>
</tr>
<tr>
<td>3.</td>
<td>Competence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a Trustworthiness</td>
<td>90% Good</td>
</tr>
<tr>
<td></td>
<td>b Critical thinking</td>
<td>93,3% Good</td>
</tr>
<tr>
<td></td>
<td>c Punctuality</td>
<td>86,7% Good</td>
</tr>
<tr>
<td></td>
<td>d Independence</td>
<td>87,8% Good</td>
</tr>
</tbody>
</table>
The concept of maintaining faith (sincerity) in Islamic caring behaviors during nursing activities requires patience, thankfulness, and consistency. Patience means a nurse should not easily get angry or despairing (19). Forbearance is very appropriate behavior for nurses to display so that they are able to face and accept any expression of positive and negative feelings from patients. In the meantime, gratitude means placing something according to its function, according to God’s will (18). This situation emphasizes that nurses should always be grateful for work because of the many blessings God has always given to nurses. Thanksgiving can mean the attitude of taking care of and utilizing the best of the grace and gift of God in a good way and for a good purpose (20). Consistency means that the nurse is steadfast or constantly doing good according to religion (17). Gratitude and consistency are very much in line with the behavior of nurses who can be a support for spiritual strength and unlock the patient’s spiritual dimension.

The concept of compassion in Islamic caring behaviors during nursing activities requires wise, prioritize other people, beneficial, and well-mannered. The Compassion In Islam, affection is known as Mahabbah. Therefore, nurses should be affectionate in showing their caring behavior, which is strongly urged in Islam. Commendable attitudes for nurses include being well mannered, friendly, calm, clean, and maintaining confidentiality (16). Wisdom means a nurse must be a wise person in providing nursing care (9). Wise is very appropriate in the behavior of nurses to foster sensitivity to self and to others by thinking smartly and wisely to address problems. The behavior of nurses in prioritizing others is in line with increasing the feeling the nurse has to always put others ahead of him or her (altruistic). Well mannered means a nurse needs to be gentle, quietly spoken, and display behaviors that are compassionate, empowering, and helpful (19). Hospital nurses at the research site display good behavior, which results in them being categories as good. Well mannered is very much in line with the behavior of the nurse in being able to establish a good relationship with the patient.

According to the test result, another forming component in the characteristics of Islamic caring is competence. Competence in Islam Mans expert/expertise. The Islamic caring behavior of nurses in the variable of competence, or professionalism, showed a positive result (11). Being professional in work means working in accordance with the principles of the discipline, being honest and responsible, willing to help, and co-operative (16). It is considered that being professional means to work smartly and knowledgeably. Critical thinking, trustworthiness, punctuality, and independence are qualities that individual Indonesian nurses need to be maximally competent.

CONCLUSIONS

The Islamic caring model found is nurse’s behavior that emphasizes Islamic value that includes the character of maintaining belief, compassion, and competence to enhance the psycho-spiritual comfort.

Conflict of Interest: We have no conflicts of interest to disclose

Source of Funding- Self

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Influence of Picture and Picture Method against Moral Development of Children

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ABSTRACT

Misbehaviour phenomenon in elementary school children can be caused by lack of moral development of children. The number of children with negative moral behaviour increases year by year both in quantity and quality. Internal and external factors can be the main effects of inadequate moral development of children. The aim of this study is to explain the effect of picture and picture method against moral development of children aged 10-11 years. Pre-experimental research with one-group pre-post test. Population of the research consisted of 165 children in Tanah Kalikedinding IV Elementary School. Sampling was conducted by using purposive sampling technique (n=117 respondents). The independent variable is the picture and picture method, while the dependent variable is the moral development. Collecting samples using observatory sheet and analysis using Wilcoxon Signed Rank Test with significant level of α = 0.05. There was an increasing percentage from pre test and post test. Picture and picture method can be used as an alternative for developing children behaviour. For the future research, it is expected to use control group to examine which factors influence moral development of children.

Keywords: picture and picture method, moral, development, children

INTRODUCTION

According to Kohlberg’s belief empirically proved that Individuals with low moral level will tend to commit violence or crime more often compared to individuals with high moral level(1). Based on data of Child Protection Commission (Komisi Perlindungan Anak), Child Protection Cluster 2011-2016 found that from 7,690 children facing child deviation cases, 1,881 children dealt with health related issues and NAPZA (drugs), and 2,345 children experienced educational problems such as brawls and bullying(2). According to First Class Bureaucracy Surabaya, the number of children facing the law in Surabaya is increasing from year to year, by evidence that there were 500 children in 2016 who need assistance and not only the number of cases increased but also the quality of the cases more complicated(3).

Based on surveys conducted by researcher on Tanah Kalikedinding IV Elementary School Surabaya from 2017 with 47 students aged 10-11 years, there were 65,96% children taunting/scorning other fellow students, 63,83% children starting physical aggression (punching, kicking and fighting), 34,04% violating school regulations, 23,40% not respecting school environment such as littering or harming school stools/walls and 14,89% taking fellow students goods without permission.

School-aged children are individuals of 6-12 years old in development character period through verbal reinforcement, exemplary and identification. These aspects can be obtained through education at school as development of attitude and good habit(4). Children having poor mental, moral and ethical values will be easily influenced by three main factors of juvenile delinquency, i.e. media, technology and friends(5). Children moral development is in line with development of cognitive aspect, meaning that the stage of cognitive...
development for children aged 7-11 years old is on operational concrete phase\(^6\), i.e. children can understand rules from conversations resulting on a logical thinking pattern and operational mentality\(^7\).

Moral education is important point for children to avoid bad influences from their social environment, leading them to possess good behaviour and to act rightly\(^8\). *Picture and picture* learning model is one of the active learning methods to create cooperation among students to solve problems\(^9\). This method is a cooperative method, children will learn to understand rules and get moral values on right or wrong as well as the reasons through observation of pictures. According to social-learning theory, learning mostly occurs through observation-control, which leads to *vicarious reinforcement* by formulating expectation of behavioural outcomes without self-directed action. At the end of social-learning process, children will be motivated to imitate or not to imitate the behaviour model he/she observed\(^10\). Therefore, Based on above description, this research aims to determine the effect of *picture and picture* method against moral development for children aged 10-11 years.

**METHOD**

The design used in this research was pre-experimental with *one-group pre post-test* approach. Population on this research was 165 student of Tanah Kalikedinding IV Elementary School Surabaya aged 10-11 years old. Sample size in this study as many as 117 children obtained from the calculation of sample size and sampling by using purposive sampling. The independent variable in this research was the picture and picture method while the dependent variable was the moral development. The instrument in this research used tools and materials in the form of images with phenomenon found in society.

Data collection in this research was done by observation for 3 days before intervention, then another intervention after 3 days of following intervention days, and the last observation after given intervention for 3 days prior to two following three days. Data analysis used in this research is Wilcoxon Signed Rank Test with significant level of \(\alpha = 0.05\).

**RESULTS**

Based on the demographic data of respondents, the major Characteristics of respondents was 10 years old, the eldest and nearly equal between male and female. Senior high school last education, Fathers’ occupations were private employee and Mothers were Housewives.

**Moral Development of Children before and after intervention**

Distribution of children moral development prior to intervention of picture and picture method showed on table 1.

<table>
<thead>
<tr>
<th>Moral Development</th>
<th>Good</th>
<th>Adequate</th>
<th>Less</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>24 (40,7%)</td>
<td>31 (52,5%)</td>
<td>4 (6,8%)</td>
<td>59</td>
</tr>
<tr>
<td>Girls</td>
<td>26 (44,8%)</td>
<td>30 (51,7%)</td>
<td>2 (3,5%)</td>
<td>58</td>
</tr>
<tr>
<td><strong>Status in the Family Order</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/Only Child</td>
<td>6 (54,5%)</td>
<td>4 (36,4%)</td>
<td>1 (9,1%)</td>
<td>11</td>
</tr>
<tr>
<td>Eldest Child</td>
<td>18 (40,9%)</td>
<td>23 (52,3%)</td>
<td>3 (6,8%)</td>
<td>44</td>
</tr>
<tr>
<td>Middle Child</td>
<td>11 (37,9%)</td>
<td>17 (58,6%)</td>
<td>1 (3,5%)</td>
<td>29</td>
</tr>
<tr>
<td>Youngest Child</td>
<td>15 (45,5%)</td>
<td>17 (51,5%)</td>
<td>1 (3%)</td>
<td>33</td>
</tr>
<tr>
<td><strong>Mother Working Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>10 (41,7%)</td>
<td>13 (54,2%)</td>
<td>1 (4,1%)</td>
<td>24</td>
</tr>
<tr>
<td>Unemployed</td>
<td>40 (43%)</td>
<td>48 (51,6%)</td>
<td>5 (5,4%)</td>
<td>93</td>
</tr>
</tbody>
</table>
The influence of picture and picture method on moral development of children as in Table 2.

There is an increasing trend from both pre-test and post test results. Increase based on the characteristics of the moral values of children, from which initially from average characteristic to become children with good moral characteristic. Based on statistical test results from Wilcoxon Sign Rank Test shows the results $p = 0.000 < \alpha$, which means there is influence from picture and picture method towards moral development of children aged 10-11 years.

**Table 2 Moral development of children before and after intervention**

<table>
<thead>
<tr>
<th>Moral development</th>
<th>Before</th>
<th></th>
<th>After</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
<td>%</td>
</tr>
<tr>
<td>Category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>50</td>
<td>43</td>
<td>74</td>
<td>63</td>
</tr>
<tr>
<td>Adequate</td>
<td>61</td>
<td>52</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>Less</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100</td>
<td>117</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>38.60</td>
<td></td>
<td>42.63</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>39.00</td>
<td></td>
<td>43.00</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.91</td>
<td></td>
<td>7.00</td>
<td></td>
</tr>
<tr>
<td>Positive Ranks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Z$</td>
<td></td>
<td></td>
<td>-7.657</td>
<td></td>
</tr>
<tr>
<td>Wilcoxon Signed Rank Test $p$</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 showed that children of male gender have more moral values in the sufficient category. Girls have better category moral values than boys. Based on the order of the child in the family and the status of working mother and not working have moral development in adequate category.

**Table 3. Characteristic of Moral Development**

<table>
<thead>
<tr>
<th>Moral value</th>
<th>Before</th>
<th></th>
<th>After</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Category</td>
<td>Average</td>
<td>Category</td>
</tr>
<tr>
<td>Honest</td>
<td>1.66</td>
<td>Less</td>
<td>2.95</td>
<td>Adequate</td>
</tr>
<tr>
<td>Discipline</td>
<td>3.22</td>
<td>Good</td>
<td>3.33</td>
<td>Good</td>
</tr>
<tr>
<td>Responsibility</td>
<td>2.97</td>
<td>Adequate</td>
<td>3.13</td>
<td>Good</td>
</tr>
<tr>
<td>Politeness</td>
<td>2.9</td>
<td>Adequate</td>
<td>3.17</td>
<td>Good</td>
</tr>
<tr>
<td>Caring</td>
<td>3.04</td>
<td>Good</td>
<td>3.18</td>
<td>Good</td>
</tr>
<tr>
<td>Confidence</td>
<td>2.47</td>
<td>Adequate</td>
<td>2.73</td>
<td>Adequate</td>
</tr>
<tr>
<td>Average total</td>
<td>2.71</td>
<td>Adequate</td>
<td>3.08</td>
<td>Good</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Based on research of moral development towards children aged 10-11 years in Tanah Kalikedinding IV Elementary School Surabaya, before the intervention found that more than a half have adequate moral, while less than a half have good moral and there is a small part of child whom had less moral. This data shows
that less and adequate moral value children still cheat very often during test/post test learning process, do not pay attention to the teacher during lessons, disturbing fellow friends, not dare to express opinions, etc. This corresponds to individuals who have low morals will more often commit violation or indications of crime than individuals with high moral\(^{(13)}\). Children with better moral values tends to be more independent and able to sort out the positive and negative vibes/values\(^{(11)}\).

Before the intervention, the moral characteristic of the average child is in adequate category. Moral values of honesty, responsibility, politeness and self-confidence are not only influenced by external factors, but also influenced by his/her own choice such as how these children resist the temptation when dealing in a particular situation. There are 2 processes of moral behavior in children, the basic process includes the process of reinforcement, punishment and imitation that can give an individual a way to learn about a particular response and why individual responses are different from the other; and self-control and able to resist temptation by developing self-control ability to avoid stealing, cheating, and lying\(^{(12)}\).

The majority of children who have less and adequate moral value is the boys. This is consistent with the results of the study that boys are more difficult to regulate than girls\(^{(13)}\). Boys tend to be more competitive, conflict-prone, egoist, risk-taker, and seek for dominance compared with girls\(^{(14)}\). Based on observations in the field, boys tend to pay less attention to teacher, more difficult to manage and more often annoy their friends than girls.

Level of Children moral development found that the sequence (order) of children in the family does not affect the moral development of children in particular. Whether he/she is the only child, eldest, middle or youngest child does not show any dominating characteristics in child moral development\(^{(13)}\). Each child has a positive and negative character, which is the eldest son has high motivation, tend to talkative and super conscientious, middle child tend to be kind and friendly but unwillingly attached, and when the eldest child has more cheerful, sociable but very sensitive trait, the only child is very dependable but irritable and less forgiving\(^{(15)}\).

Based of working parental status whether the mothers work or not, indicated that there is no positive influence on the moral development of children. It is been proven that children with both working or not working mothers do not show any significant results in forming/teaching the moral development of children into good, enough or less categories. Factors that can affect moral development is the role of the family in providing examples and a good moral understanding for the child him/herself. Role of the family is important in the development of moral values through the behavior of people in the house, the punishment given (to the children) when doing bad things, and the role of the family in giving understanding and example of good and bad deeds\(^{(16)}\).

Moral development after the intervention mostly shows good improvement. This improvement can be proven by children’s behavior, such as not cheating during the test/post test learning, pay attention to the teacher during class, not disturbing friends, dare/able to express opinions, etc. Children whom experienced increase in moral development are mostly active children during the process of picture and picture methods intervention. According to social learning theory, there are four phases in social learning, which are the attention phase, the reminder phase, the motoric reproductive phase (producing observed behavior), and the last phase of motivation to perform such behavior or not\(^{(17)}\). When the child is active in this method, the child will be stimulated to observe the image provided by the researcher, then the process of thinking about good and bad morals occurs, and then there is guidance to him/herself to produce observed behavior, so there is a motivation to behave in a good way according to their moral values\(^{(21)}\).

Not all children have increased in morality, but also there are small number of children whose moral values remain, and whose moral value decreased. This influenced by other factors, such as differences in ways of thinking about moral decisions and how they feel about morality. The activity level of the children in accepting this method is seen from their discussion activities in arranging the images provided by the researcher into logical sequence, in addition from that activity children also had to be active in order of responding to pictures arranged by other groups into logical sequence. Children aged 10-11 years are individuals with concrete operational thinking, i.e. the child develops inability to use logical thinking to solve concrete problems\(^{(22)}\). A greater consistency and generosity in elementary school children will arise when
there is mutual stimulation and acceptance of arguments among peers in addition to parental encouragement and advice\textsuperscript{(12)}. Children will easily understand the importance of moral values when children able to discuss about their understanding with their peers rather than just listening lectures from teachers or parents.

The characteristics of moral values after intervention, is increasing, the average of children into good category. This increasing obtained because interaction of children in obey the rules being made, process of thinking and understanding of children in taking moral values in the process of intervention when playing using this method. The benefits of playing is to play a moral value in children by learning right or wrong when interacting with their friends and understanding the rules defined in the game\textsuperscript{(18)}. Game is part of the process of child growth, and important to manage it as a means of educating children effectively\textsuperscript{(19)}.

The most significant improvement based on the characteristics of moral values is the value of honesty and caring. Those values have consequences to the child’s belief in his religion. Religious values teaches acceptable and proper thing to done and become a ‘controller’ for not doing something based on his/her likes or desires\textsuperscript{(16)}. The most increase in the value of honesty and care is the consequences of religion such as getting a sin when lying or not care about others, so the children will tend to do good deeds that are considered good according to his/her religion.

\textit{Picture and picture} method is one of the active learning media that can encourage cooperation among students in solving the problem\textsuperscript{(9)}. This learning method has an active, innovative, creative, and fun character\textsuperscript{(20)}. \textit{Picture and picture} method is a good play method to be applied in improving moral development of children aged 10-11 years because it suits to the child’s thinking level, so there is a good process to improve the moral development of children. Based on the description above shows that there was influence from \textit{picture and picture} method towards moral development of children aged 10-11 years.

**CONCLUSION**

The children moral development children aged 10-11 years prior from the intervention of \textit{picture and picture} shows that more than half children had enough moral development and a small part from population had less moral development, and after the \textit{picture and picture} intervention shows an increase for most children towards better moral development. The best moral value increase is the value of honesty and care, because children tend to do good behavior according to his/her religion. The \textit{picture and picture} method can provide self-coaching to the child through 4 phases, which is the attention phase, the reminder phase, the motoric reproduction phase, and the motivation to perform phase such behavior or not.

**Ethical Clearance:** This research has earned ethic certificate with ethic number of 442 from Faculty of Nursing Universitas Airlangga.

**Conflic of Interest:** We declare that we have no conflict of interest

**Source of Funding:** None

**REFERENCES**

The Awareness of the Effect of Black Seeds on Blood Glucose in Private University

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ABSTRACT

It has been known that Nigella sativa has various pharmacological activities and one of it are as an anti-diabetic effect. This study aimed to assess the level of awareness in different genders regarding Nigella sativa on blood glucose among the university students. This study designed as a cross-sectional study. The self-administered questionnaire was given to respondents which asked about sociodemographic factors, health concerns and awareness regarding Nigella sativa and blood glucose. Majority of the respondents were aware about Nigella sativa (63%) and also received diabetes education before this (67.8%). There was a significant difference between genders regarding the awareness of Nigella sativa (p-value<0.05). Meanwhile, there was no significant association between genders and the awareness of diabetes mellitus (p-value>0.05). Most of the respondents believed that Nigella sativa is a home remedy (60.3%) and can reduce the mortality and morbidity of chronic disease (73.8%). Moreover, only (30.5%) of the respondents knew that Nigella sativa works as an anti-diabetic. However, rate of understanding about diabetes mellitus is fair (51.1%) and they unable to record their blood sugar level for safe keeping (16.2%). In addition, most respondents believed that diabetes is a serious illness (84.7%) and majority thought that by controlling food intake would overcome diabetes (65.1%) rather than medication (18.2%) or exercise (16.7%). In conclusion, there is a need to increase the awareness regarding Nigella sativa through campaigns and mass media. This would help them to have better knowledge and benefits about Nigella sativa especially as an anti-diabetic supplement.

Keywords: Nigella sativa, blood glucose, diabetes mellitus, awareness

INTRODUCTION

Nigella sativa is an annual herb that belongs to the family Ranunculaceae and they are commonly known as black seed and the usage of this Nigella sativa have been used for almost thousands of years regardless as a spice, food preservative and medicinal herbs to protect several disorders¹. They are widely found in the Mediterranean area and some other regions in the world which are known by many names such as in Arabic countries called as habit-ulsauda or commonly known as black cumin or black seed².

For the last two decades, many studies have been conducted on the effect of Nigella sativa towards various body systems³. It has been revealed that Nigella sativa has various pharmacological activities including anti-diabetic, anti-hypertensive, anti-inflammatory and antimicrobial activities. A lot of these activities have
been revealed due to the presence of Thymoquinone. It has been reported that *Nigella sativa* had not been always looked up to as a part of alternative medicine or it has always been overlooked by a lot of people including the health care provider. Traditionally, *Nigella sativa* has not been well understood of its uses and what could they do.

For the past few years, it has been known that the chronic and incurable diseases, such as diabetes, hypertension and cancer has led to the demand of uses of complementary alternative medicine. The National Centre for Complementary and Alternative Medicine defined it as group of medicinal products that have not been considered as a part of modern medicine.

In a nutshell, the importance of this study is to validate the awareness of *Nigella sativa* or also known as black seed on blood glucose among university students. This research was done to highlight on the benefits of *Nigella sativa* itself that could benefits a person’s health. Also, to identify the level of awareness of *Nigella sativa* on blood glucose and relationship between the level of awareness in gender among university students by giving out questionnaires. There are tons of privileges of taking this seed as a supplement which could promote our health and reduce the risk of getting diabetes mellitus by reducing the blood sugar levels.

**MATERIALS AND METHOD**

**Study design and source population**

A quantitative cross-sectional study was conducted among 413 students in private university from July 2017 until December 2017. Simple random sampling method was used for selecting our participants. Based on the simple formula for single population studies the sample size was calculated using 95% confidence limit and 0.05 as a level of significant. Thus, the sample size calculated was 413 subjects and 20% as additional sample was added to make the total of 413 respondents.

**Research tool of data collection**

A self-administered questionnaire was used to collect the data. The questionnaire was constructed by referring to the previous related research. It was validated by using content and expert validation from different universities. Pre-test was used also before conducting the study to ensure all questions were understandable and editing the unclear questions. The questionnaire consists of three categories: 7 demographic factors, 7 regards awareness regarding *Nigella sativa*, and 11 medical health information regarding diabetes mellitus items. The questionnaire comprises of close-ended questions. English was the language used in the questionnaire to collect the data.

**Ethical consideration**

Questionnaire was distributed among the students from different batches in the university after the approval of the study proposal from the Research Committee at Management and Science University (MSU). Privacy and confidentiality were taken to the participant’s information. Participants were given a briefing background before the questionnaires distribution. Voluntarily without any oppression the informed consent was taken directly from the students by filled the consent form then collected data were obtained by answering a self-administered questionnaire.

**RESULTS**

**Socio-Demographic of the Study Population**

A total of 413 respondents were participated in this survey. Table 1 showed that the majority of our participants were male (50.1%), aged between 21-23 years old (54.2%), Malay (65.9%), single (82.8%) and degree students (79.2%).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>207</td>
</tr>
<tr>
<td>Female</td>
<td>206</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>122</td>
</tr>
<tr>
<td>21-23</td>
<td>224</td>
</tr>
<tr>
<td>24-26</td>
<td>60</td>
</tr>
<tr>
<td>27-29</td>
<td>5</td>
</tr>
<tr>
<td>30+</td>
<td>2</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>272</td>
</tr>
<tr>
<td>Indian</td>
<td>98</td>
</tr>
</tbody>
</table>
Cont.... Table 1: Demographic data results of the participants

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>23</td>
<td>5.6</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>4.8</td>
</tr>
<tr>
<td>Single</td>
<td>342</td>
<td>82.8</td>
</tr>
<tr>
<td>In a relationship</td>
<td>65</td>
<td>15.7</td>
</tr>
<tr>
<td>Married</td>
<td>6</td>
<td>1.5</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation</td>
<td>15</td>
<td>3.6</td>
</tr>
<tr>
<td>Diploma</td>
<td>70</td>
<td>16.9</td>
</tr>
<tr>
<td>Degree</td>
<td>327</td>
<td>79.2</td>
</tr>
<tr>
<td>Masters</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>413</td>
<td>100</td>
</tr>
</tbody>
</table>

Level of awareness regarding Nigella sativa on blood glucose

Based on the result that has been tabulated in Table 2, it was demonstrated that the level of awareness regarding Nigella sativa on blood glucose among the students was only at the average level (49.6%) representing all socio-demographic data and only (30.0%) of the respondents has a good level of awareness of Nigella sativa on blood glucose.

Table 2: Level of awareness regarding Nigella sativa on blood glucose

<table>
<thead>
<tr>
<th>Scoring</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>124</td>
<td>30.0</td>
</tr>
<tr>
<td>Average</td>
<td>205</td>
<td>49.6</td>
</tr>
<tr>
<td>Poor</td>
<td>84</td>
<td>20.3</td>
</tr>
</tbody>
</table>

Level of awareness regarding Nigella sativa on blood glucose in gender among the students

Chi square test was done to analysis the relationship between awareness and gender as shown in table 3. It was revealed that the association between gender and the awareness level was statistically significant (P= 0.001).

Table 3: Socio-Demographic data associated with awareness of Nigella sativa on blood glucose

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Good</th>
<th></th>
<th>Average</th>
<th></th>
<th>Poor</th>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>46</td>
<td>22.2</td>
<td>108</td>
<td>52.2</td>
<td>53</td>
<td>25.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Female</td>
<td>78</td>
<td>37.9</td>
<td>97</td>
<td>47.1</td>
<td>31</td>
<td>15.1</td>
<td></td>
</tr>
</tbody>
</table>

Comparison between awareness regards Nigella sativa with gender among the students

Based on the finding from table 4, descriptive analysis was performed for male and female in each variable included in this part by using frequency and percentage. Chi square test was performed between gender and the included variables related to the awareness. It was demonstrated that the difference between male and female in regards of heard about Nigella sativa, Nigella sativa a home remedy or medication, thoughts on people who consume Nigella sativa were statistically significant (P = 0.001, P= 0.002, P= 0.024) respectively. On the other hand, and consume Nigella sativa showed no significant difference statistically between male and female (P= 0.225, P= 0.314, P= 0.133) respectively.

Table 4: awareness regards of Nigella sativa with gender

<table>
<thead>
<tr>
<th>Statements</th>
<th>Demographic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Heard about Nigella sativa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>113</td>
<td>54.59</td>
</tr>
<tr>
<td>No</td>
<td>94</td>
<td>45.41</td>
</tr>
<tr>
<td>Consume Nigella sativa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>73</td>
<td>35.27</td>
</tr>
<tr>
<td>No</td>
<td>134</td>
<td>64.73</td>
</tr>
<tr>
<td>Nigella sativa a home remedy or medication</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home remedy</td>
<td>109</td>
<td>52.65</td>
</tr>
<tr>
<td>Medication</td>
<td>98</td>
<td>47.34</td>
</tr>
</tbody>
</table>
Thoughts on people who consume Nigella sativa

<table>
<thead>
<tr>
<th>Statements</th>
<th>Male</th>
<th>Female</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Health purposes</td>
<td>158</td>
<td>76.33</td>
<td>176</td>
</tr>
<tr>
<td>Own interest</td>
<td>49</td>
<td>23.67</td>
<td>30</td>
</tr>
</tbody>
</table>

Comparison between prevalence of blood glucose with gender

Table 5: Prevalence of blood glucose in gender

<table>
<thead>
<tr>
<th>Statements</th>
<th>Male</th>
<th>Female</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Rate understanding of diabetes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>82</td>
<td>39.61</td>
<td>100</td>
</tr>
<tr>
<td>Fair</td>
<td>112</td>
<td>54.11</td>
<td>99</td>
</tr>
<tr>
<td>Poor</td>
<td>13</td>
<td>6.28</td>
<td>7</td>
</tr>
<tr>
<td>Test blood sugar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>106</td>
<td>51.21</td>
<td>137</td>
</tr>
<tr>
<td>No</td>
<td>101</td>
<td>48.80</td>
<td>69</td>
</tr>
<tr>
<td>Difficulties in monitoring blood sugar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>20.29</td>
<td>32</td>
</tr>
<tr>
<td>No</td>
<td>165</td>
<td>79.71</td>
<td>174</td>
</tr>
<tr>
<td>Having low blood sugar reactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>20.29</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>165</td>
<td>79.71</td>
<td>156</td>
</tr>
<tr>
<td>Having high blood sugar reactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>6.76</td>
<td>27</td>
</tr>
<tr>
<td>No</td>
<td>193</td>
<td>93.24</td>
<td>179</td>
</tr>
<tr>
<td>Family history</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>98</td>
<td>47.34</td>
<td>112</td>
</tr>
<tr>
<td>No</td>
<td>64</td>
<td>52.66</td>
<td>72</td>
</tr>
<tr>
<td>Not sure</td>
<td>45</td>
<td>21.74</td>
<td>22</td>
</tr>
<tr>
<td>Opinion on how diabetes should be treated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>35</td>
<td>16.91</td>
<td>40</td>
</tr>
<tr>
<td>Controlling food intake</td>
<td>131</td>
<td>63.29</td>
<td>138</td>
</tr>
<tr>
<td>Exercise</td>
<td>41</td>
<td>19.81</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 5 shows the frequency and percentage for male and female in the included variable in this comparison. The outcome (gender) and all variables in this part were analysed by using Chi square test. The association between gender and rate understanding of diabetes, the blood sugar, having high blood sugar reactions and family history was statistically significant (P < 0.05). On the other hand, difficulties in monitoring blood sugar, having low blood sugar reactions and opinion on how diabetes should be treated showed no significant association with gender (P > 0.05).
DISCUSSION

This study is to determine the level of awareness toward the *Nigella sativa* and its effect on blood glucose among the students. The medical practitioner has always failed to see *Nigella sativa* as a part of supplement that might help to improve a person’s health. The level of awareness of the privet university students regarding *Nigella sativa* was at high scoring level. This was sustained based on the previous study stating that the awareness of *Nigella sativa* or best to be known as complementary medicine is at high level (71%) same goes to its prevalence (67%) among their participants.

In addition to this, there was also a significant difference between the levels of awareness of *Nigella sativa* on blood glucose in gender among the private university students. These results are in conformity with the finding of previous studies stating that there is a significant difference between gender. While the current study are in contrast with the recent result, who reported that there is no statistical significant difference involving awareness regarding *Nigella sativa* on blood glucose between male and females (p < 0.295). This insignificance was maybe due to the respondents chosen among medical students. Therefore, they might have a good awareness on *Nigella sativa* on blood glucose between the genders.

After doing this research, we can also say that in this 21st century, people have been searching for alternative medicine too to treat their illnesses. It has been proven based on previous study, these types of alternative medicine or such herbs like *Nigella sativa* has always been used either for medicinal purposes, supplements or as a spice in their cooking. From what can we observe is that, overall, female has a better awareness regarding *Nigella sativa* compare to male. This has been proven by previous study, stating that, female has a better knowledge in regards to complementary medicine.

Proven by previous study stating that *Nigella sativa* has various pharmacological effects due to the presence of thymoquinone. One of the most significant pharmacological effects for *Nigella sativa* is anti-diabetic. *Nigella sativa* has been proved to reduce the blood sugar level is by the presence of essential oil along with the presence of thymoquinone. On top of that, treatment with *Nigella sativa*’s extract alongside with the presence of thymoquinone had proven to reduce the glucose serum levels and increase the insulin tissue in rats. This might prove that *Nigella sativa* can be use clinically to treat diabetes for the protection of beta cells against oxidative stress.

CONCLUSION

From this study, it can be concluded that, the respondents of this study had successfully shows an adequate level of awareness regarding *Nigella sativa* on blood glucose. There was a positive level of awareness of *Nigella sativa* on blood glucose in the privat university students. Therefore, the null hypothesis is rejected. However, there is a significant difference between genders on the level of awareness regarding *Nigella sativa* on blood glucose (p < 0.05). Hence, the null hypothesis is also rejected.

LIMITATION

There are a few limitations to this study that should be highlighted on which may affect the findings. To begin with, the survey was confined to only the privat university students due to the limited time that was given to conduct this research. Moreover, failure to give out the survey other than the privat university students is because of long processes and many authorities approvals.

RECOMMENDATION

Further strategies needed to be considered to increase the level of awareness of *Nigella sativa* on blood glucose is first and foremost, conducting a campaign to raise awareness are one of the few steps that can be as an eye-opener to the world. Other than that, using media mass as a medium to spread the awareness since it is one of the influenced mass nowadays to help them to have a better knowledge and benefits about *Nigella sativa* as an anti-diabetic supplement.

Conflict-of-Interest: All authors have declared no conflict-of-interest.

Research Fund: This research is self-finding.

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The Correlation between the Quality of Nursing Work Life and Job Performance

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ABSTRACT

Introduction: Nurses are one of the most important health workers who contribute to determining the quality of health services. Giving more attention to their condition and needs will increase their loyalty to the nursing profession, which will lead to a positive impact on their work performance. Therefore, this study aimed to analyse the correlation between the individual factors and the nurse’s performance, and also to see if there was a correlation between QNWL and the nurse’s performance. Method: The design of the study was a correlational research study with a cross-sectional approach. The sample consisted of 106 nurses, collected by simple random sampling. The independent variables were individual factors (education and length of work), and QNWL. The dependent variable was job performance. The data was collected by using questionnaires analysed using multiple linear regression with (p<0.05) degree of significance. Result and Analysis: The results showed that there was a correlation between education and the nurses’ performance (p=0.035), and also a correlation between QNWL and nurses’ performance (p=0.000). The length of time they’d been working was not influenced by the nurses’ performance (p=0.103). Discussion: The individual factors of education and QNWL had an impact on the nurses’ performance. It is suggested for the next researcher to analyse other significance factors that influence QNWL.

Keywords: Nurses, Job Performance, Individual factors, Education, Length of work, QNWL

INTRODUCTION

A hospital is an institution which provides health services through promotive, preventive, curative and rehabilitative efforts¹. Health care facilities in hospitals can run in line with the quality of health care which is given by the health workers in the hospital.

Health care quality or employee performance is influenced by several factors, namely individual, organizational, and work factors themselves. Individual factors include ability, knowledge, education, length of work, skills, motivation, and norms. Organizational factors consist of rewards, training, vision, mission, and leadership models in work². Nursing services as an integral part of health services have a very large contribution in determining the quality of care in hospitals³. Work atmosphere, unfavorable work environment, and heavy workload can hinder the professional service process within the hospital. Concern for the condition of the nurse, fostering the loyalty of nurses to provide better service⁴.

Low salary and a heavy workload will cause nurses to experience work fatigue, decreased motivation, decreased willingness, and create a poor quality nursing work life⁵ (QNWL). QNWL is a significant element which is owned by the nurse, and it can affect the healthcare quality that is given to the patients⁶.

Research related to QNWL is important to determine the quality of work life of nurses in every hospital⁷. Different hospitals with different organizational systems and environments will produce different QNWL for each employee⁸. This difference can be related to the state of the unit, the number and type of units, policies,
There is still limited only a number of research studies related to the relationship between the quality of nursing work life and the nurse’s work performance. The objective of this research was to find out the relationship of the individual factors of education and length of work toward the nurse’s work performance, as well as the relationship between QNWL and the nurse’s work performance.

**METHOD**

This study was a correlational research study conducted using a cross sectional approach which involved nurses as the respondents. The sample of this research was made up of hospital nurses, totalling 106 respondents. The inclusive criterion was that the nurses had been working for a minimum of three years. The independent variables used in this research were individual factors, namely education, length of work, and QNWL. The dependent variable employed was work performance.

The data was collected using a questionnaire. The QNWL questionnaire was the questionnaire developed by Brooks and Anderson which was then adapted from a previous study by Prihastuty. The data analysis was done by a descriptive test and multiple linear regression.

**RESULT**

The respondents of this research were mostly aged between 20-30 years old, of whom (89 people) were female (84%). The respondents’ working times were almost in balance, in which 52 people had a 3-5 years working period (49.1%) and 54 others had a working period of more than 5 years. Employment status was dominated by contract employee, with 56 people (52.8%). Most of the respondents were included in the good category for all 4 aspects of QNWL. In the aspect of work design, which defined work satisfaction, autonomy, work proportion, performance and staffing, most of them had a fair assessment result (Table 1).

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work life-home life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>70</td>
<td>66,0</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>28</td>
<td>26,4</td>
</tr>
<tr>
<td>4</td>
<td>Poor</td>
<td>8</td>
<td>7,5</td>
</tr>
<tr>
<td>5</td>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Work design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Good</td>
<td>46</td>
<td>43,3</td>
</tr>
<tr>
<td>8</td>
<td>Fair</td>
<td>57</td>
<td>53,8</td>
</tr>
<tr>
<td>9</td>
<td>Poor</td>
<td>3</td>
<td>2,8</td>
</tr>
<tr>
<td>10</td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td>11</td>
<td>Work context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Good</td>
<td>87</td>
<td>82,1</td>
</tr>
<tr>
<td>13</td>
<td>Fair</td>
<td>18</td>
<td>17,0</td>
</tr>
<tr>
<td>14</td>
<td>Poor</td>
<td>1</td>
<td>0,9</td>
</tr>
<tr>
<td>15</td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td>16</td>
<td>Work world</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Good</td>
<td>71</td>
<td>67,0</td>
</tr>
<tr>
<td>18</td>
<td>Fair</td>
<td>15</td>
<td>14,2</td>
</tr>
<tr>
<td>19</td>
<td>Poor</td>
<td>20</td>
<td>18,9</td>
</tr>
<tr>
<td>20</td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td>21</td>
<td>QNWL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Good</td>
<td>33</td>
<td>31,1</td>
</tr>
<tr>
<td>23</td>
<td>Fair</td>
<td>56</td>
<td>52,8</td>
</tr>
<tr>
<td>24</td>
<td>Poor</td>
<td>17</td>
<td>16,0</td>
</tr>
<tr>
<td>25</td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
</tbody>
</table>

This research study showed that most of the respondent’s demonstrated good work performance in all of the components related to their nursing care documentation. This included an assessment of their work performance as well as the total score of the work performance assessment (Table 2).
Table 2. Work Performance

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>57</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>21</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>28</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>62</td>
<td>58.8</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>30</td>
<td>28.3</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>14</td>
<td>13.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>76</td>
<td>71.7</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>20</td>
<td>18.9</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>10</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>77</td>
<td>72.6</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>28</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3 shows that level of education had a significant influence on the nurse’s work performance. The table explains that D3 nurses tend to have good and sufficient performance appraisal categories, while most nurses with S.Kep. Ns education background have sufficient performance assessment categories.

Table 3. The relationship of the individual factors: education and work performance

<table>
<thead>
<tr>
<th>Education</th>
<th>Work Performance</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good (%)</td>
<td>Fair (%)</td>
<td>Poor (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>22 (20.8)</td>
<td>21 (19.8)</td>
<td>8 (7.5)</td>
<td>51 (48.1)</td>
<td></td>
</tr>
<tr>
<td>S.Kep</td>
<td>3 (2.8)</td>
<td>0 (0)</td>
<td>5 (4.7)</td>
<td>8 (7.5)</td>
<td></td>
</tr>
<tr>
<td>S.Kep., Ns</td>
<td>19 (17.9)</td>
<td>22 (20.8)</td>
<td>6 (5.7)</td>
<td>47 (44.3)</td>
<td></td>
</tr>
</tbody>
</table>

The data above in Table 4 shows that length of work did not have a significant influence on the work performance of the nurses. Nurses with <5 years of work experience have good performance appraisals while nurses who have worked > 5 years mostly have sufficient performance assessments.

Table 4. The relationship of the individual factors: length of work and work performance.

<table>
<thead>
<tr>
<th>Length of work</th>
<th>Work Performance</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good (%)</td>
<td>Fair (%)</td>
<td>Poor (%)</td>
<td></td>
</tr>
<tr>
<td>3-5 years</td>
<td>23 (21.7)</td>
<td>19 (17.9)</td>
<td>10 (9.4)</td>
<td>52 (49.1)</td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>21 (19.8)</td>
<td>24 (22.6)</td>
<td>9 (8.5)</td>
<td>54 (50.9)</td>
</tr>
</tbody>
</table>

Overall the performance of nurses was in the sufficient category with a sufficient QNWAL assessment of 41 nurses (38.7%) (Table 5).
Table 5. The Relationship of QNWL and Work Performance

<table>
<thead>
<tr>
<th>QNWL</th>
<th>Work Performance</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good (%)</td>
<td>Fair (%)</td>
</tr>
<tr>
<td>Work life/home life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>43</td>
<td>26</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Work design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Fair</td>
<td>23</td>
<td>27</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Work context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>Fair</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Work world</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>37</td>
<td>29</td>
</tr>
<tr>
<td>Fair</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>QNWL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td>Fair</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Nurse performance is significantly influenced by individual factors, namely education with a determination coefficient value of 26.4% with a significance value of 0.035. QNWL has a significant influence on the performance of nurses both individually and simultaneously. The dimensions of home and work life and work context have a significance level of 0.000. Job design has a value of 0.001 while the work life with a value of 0.021 (Table 6).

Table 6. The Summary of the Multiple Linear Regression Analysis on the Relationship of Nursing Work Life Quality and the Nurses’ Work Performance

<table>
<thead>
<tr>
<th>No</th>
<th>Hypothesis</th>
<th>R</th>
<th>B</th>
<th>sig.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relationship of individual factors: education and work performance</td>
<td>0.264</td>
<td>5.817</td>
<td>0.035</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Relationship of individual factors: length of work and work performance</td>
<td>0.264</td>
<td>8.598</td>
<td>0.103</td>
<td>Insignificant</td>
</tr>
<tr>
<td></td>
<td>Relationship of work life/home life and work performance</td>
<td>0.813</td>
<td>0.518</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Relationship of work design and work performance</td>
<td>0.813</td>
<td>0.287</td>
<td>0.001</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Relationship of work context and work performance</td>
<td>0.813</td>
<td>0.705</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Relationship of work world and work performance</td>
<td>0.813</td>
<td>0.180</td>
<td>0.021</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Relationship of QNWL and work performance</td>
<td>0.813</td>
<td>-</td>
<td>0.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>
DISCUSSION

The good results from the assessment of work performance based on the nursing care documentation available was mostly weighted toward the nurses with Diploma degree (D3). However, the poor results were also shown by the nurses with the same educational background. The nurses with a nursing educational background tended to have a fair assessment score of work performance. Therefore, the relationship between level of education and work performance was insignificant.

The previous theory stated that the background of the nurse’s education had a significant influence on the work performance of the nurses. The higher the education level, the higher the thinking ability, logic, critical skills and systematic work methods. A research study with similar results has been previously conducted, and the research showed that level of education influenced the nurses’ work performance while conducting their nursing care. The results were in line with Gibson’s theory drawn up in 1997 and Trihastuti’s research in 2016.

The theory developed by Gibson explained that an individual which has been working in an organisation for a long time will have more experience, so then their work performance will be better. This was different from Prihastuty, who said that a new nurse tends to have high motivation and expectations related to the working environment, which provides a good level of influence on their work performance. A newly working nurse shows high motivation and enthusiasm related to their profession.

The nurses’ length of work in this research study showed an insignificant result. The work performance in this study used the nursing care documentation assessment. New nurses had high motivation and idealism related to nursing care. They obeyed and followed every room procedure in an effort to adapt themselves.

The quality of home and work life in this research covered the aspect of balance between their home and work, their remaining energy, and the policies in place in the organisation. Nurses with the ability to balance their quality of work/home life have the ability to divide their time. The feeling of being protected and going in the right direction would have a positive impact. The leadership, which was fully not authoritarian, was built with democracy and kinship and created good work performance in the nurses.

Work design has several aspects involved, namely work satisfaction, autonomy and work proportion, as well as staffing at work. The excessiveness of the nurses’ work load will affect the nursing care that they give. The work performance based on the nursing care given to their patients becomes less optimum. Meanwhile, work context explains about the effect of the working environment on the working nurses, which involves communication, supervision, cooperation, career development, and security at work. Work world, on the other hand, is the person’s point of view about nursing, their image, and the usefulness value.

Most nurses in Syarifah Ambami hospital had a fair score in relation to the three aspects of QNWL, which were the balance between their home and work life, work design, and work life. The aspect of work context showed that the majority of the nurses had a fair score in the assessment as well.

The above tables explain that all four aspects in QNWL had a significant effect on the nurses’ work performance. The regression significantly showed 0.000 point in the aspect of work life, 0.001 point in work design, 0.000 point in work context, and 0.021 in work world. The overall t significantly showed p<0.05 point, which could be defined as the four aspects of QNWL working in line with the nurses’ work performance. The better the QNWL aspects, the better their work performance as a result.

CONCLUSIONS

Findings can be used by nurse managers and decision makers to design and implement appropriate strategies to improve QNWL. Better QNWL is the key to attract and retain competent and motivated nurses and might lead to improve quality of Nursing Services.

Ethical Clearance: The research passed the ethical test conducted at the Ethics Committee of the Faculty of Nursing Universitas Airlangga number 1029-KEPK.

Source of Funding: This study is self-funded research project.

Conflict of Interest: None.
REFERENCES


Role of MRI in Comparison with DWI-MRI in Diagnosis of Intracranial Meningioma

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¹Dept. of Surgery/ College of Medicine / University of Babylon, Hilla, Iraq

ABSTRACT

Objective: Meningiomas are the most common non-glial tumours of the central nervous system (CNS), accounting for between 16 and 20 % of all intracranial tumours. This study was set up to determine the role of diffusion weighted imaging and determination of apparent diffusion coefficient (ADC) values to differentiate typical meningiomas from atypical/malignant variety.

Methods: In this cross-sectional study, 40 patients aged 24–70 years with meningiomas were included. Using routine MRI sequences, the meningiomas were diagnosed and DW images were performed. Apparent diffusion coefficient (ADC) values were measured in the lesion, in the normal area of brain parenchyma analysis. P < 0.05 was considered significant.

Results: 27.5% in age group 40-49, 80% typical characteristics meningiomas, cerebral convexity location was found in (30%), the mean ADC of atypical/malignant meningiomas (0.61±0.09) was significantly lower compared with benign meningiomas (1.22 ± 0.1).

Conclusion: Typical meningiomas have higher ADC values than atypical cases. DW MRI may be of help in differentiating typical and atypical meningiomas.

Keywords: MRI, DWI-MRI, Diagnosis, Meningioma, Cntracranial tumors.

INTRODUCTION

Meningiomas are the most common non-glial tumours of the central nervous system (CNS), accounting for between 16 and 20 % of all intracranial tumours¹.

Meningiomas represent approximately15% of all symptomatic and roughly one third of all incidental (asymptomatic) intracranial neoplasms ²,³, with a higher incidence of up to 35.2% among Asians and Africans⁴.

True meningiomas arise from meningothelial cells (arachnoid “cap” cells), and the tumors occur more frequently where these cells are most numerous⁵.

When symptomatic, meningiomas present with a wide variety of symptoms, arising from compression of adjacent structures, direct invasion of or reactive changes in the brain or due to obstruction of cerebrospinal fluid (CSF) pathways or vessels⁶.

The majority of meningiomas are spontaneous and of unknown aetiology, although recognised risk factors include previous exposure to radiation, genetic disorders such as neurofibromatosis type 2, in which the tumours may be multiple, and after head injury, although the causality in the latter is unclear ⁷.

Meningiomas are typically slow-growing tumours that arise from the meningothelial cells of the arachnoid. Histological grading of meningiomas is based on the current WHO classification. The majority of lesions are benign WHO Grade I lesions, representing approximately 90% of cases. The histological subtypes of grade I meningiomas include meningothelial, psammomatous, secretory, fibroblastic, angiomatous, lymphoplasmacyte-
rich, transitional, metaplastic and microcystic. They differ from the more aggressive meningiomas, WHO grade II (atypical) and WHO grade III (anaplastic), 5–7% and 1–3% of cases respectively, in their number of mitoses, cellularity, nuclear-to-cytoplasmic ratio, histological patterns and their relatively low risk of recurrence or aggressive growth pattern.

Meningiomas may be found along any of the external surfaces of the brain as well as within the ventricular system where they arise from the stromal arachnoid cells of the choroid plexus. The typical MRI signal intensity characteristics consist of isointensity to slight hypointensity relative to grey matter on the T1-weighted sequence and isointensity to slight hyperintensity relative to grey matter on the T2 sequence.

After contrast administration, meningiomas typically demonstrate avid, homogeneous enhancement; however, they may occasionally have areas of central necrosis or calcification that do not enhance.

Meningiomas may uncommonly demonstrate an abnormal enhancement pattern post contrast administration. The enhancement may be heterogeneous secondary to the presence of intrinsic calcification, cysts and necrosis. Ring enhancement may be seen in cases with central cyst formation, haemorrhage or necrosis with the peripheral enhancement representing typical enhancement of the viable meningeal neoplasm. Diffusion tensor imaging (DTI) may aid in the distinction with several studies reporting a decreased apparent diffusion coefficient (ADC) in high-grade tumours. Various theories have been proposed to explain the reduced ADC and include a decreased free diffusion of extracellular water and the high nuclear-to-cytoplasmic ratio of high-grade tumours, resulting in a reduction in the free translation of intracellular water. Because atypical and malignant meningiomas are more prone to recurrence and an aggressive growth pattern, DTI may provide useful diagnostic information for surgical planning and prognostication.

However, all primary benign tumor can be diagnosis by DWI. The sensitivity of DWI for diagnosis of primary benign cystic brain tumor is 100%.

The objectives of our study were to evaluate the benefits of DW MRI method, and to investigate whether it is more advantageous in the distinction and differentiation of benign from malignant meningiomas on the basis of ADC values.

**PATIENTS AND METHOD**

In this cross-sectional study, forty patients (9 males and 31 females) with an age ranging from 24-70 years (mean 57 years) were studied at the surgical wards of Al-Hilla teaching Hospital, Babylon province, Iraq, between November 2017 and June 2018 with brain meningiomas.

A complete history was taken from each patient, data taken from files of patients, age sex residence and clinical presentation. Presumptive diagnosis of intracranial extra-axial meningiomas was made using Philips Gyroscan (N.T. 3000 super-conducting, 1.5 Tesla).

DWI was done using a multislice single-shot echoplanar imaging sequence. Apparent diffusion coefficient (ADC) maps were automatically generated by the implemented software. The slice with the largest diameter of meningioma was selected for ADC calculation. In this image, a polygonal region of interest (ROI) as large as possible was manually drawn on ADC maps around the margin of the lesion (whole lesion measurement) without risking partial volume effects. In all lesions, minimal ADC values (ADCmin) and mean ADC values (ADCmean) were estimated.

The signal intensity of the meningiomas was assessed on the short- and long-TR images and the diffusion-weighted sequences. Signal intensity was judged as hypo intense, isointense, slightly hyper intense, or hyper intense to cortex, and enhancement patterns were marked as either homogeneous or heterogeneous. Typical meningiomas had homogeneous signal intensity similar to that of gray matter, intense homogeneous enhancement (no cystic/necrotic/hemorrhagic foci), smooth and distinct margins, and no evidence of brain invasion.

**STATISTICAL ANALYSIS**

Data was collected and included in a data based system and analyzed by statistical package of social sciences (SPSS, Inc., Chicago, IL, USA) version 20. Parametric data were expressed as mean ± standard deviation (SD). It was analyzed statistically using student t-test while non-parametric data were expressed as percentages and were analyzed using chi square. \( p < 0.05 \) was considered statistically significant.
RESULTS

Forty patients were included in this study. These patients aged between 24-70 years with mean age 57 years, fifteen percent of them in age group 24-29 years 22.5% in age groups 30-39 years and 50-59 years for each group, 27.5% in age group 40-49 years and 12.5% in age group 60-70 years. Male to female ratio 1:3.4, 22.5% males, 77.5% females. Solitary meningioma was presented in 92.5% and 7.5% multiple presentation.

The estimated ADC mean values of meningiomas (Meningiomas size) ranged from 0.41 to 1.78 ×10⁻³ mm²/s, with mean 0.97±0.21. Figure-1 illustrates presentation of meningiomas according to their types.

![Figure 1: Presentation of meningiomas](image)

In regard to the tumor location (Figure 2), cerebral convexity location was found in (30%), parasagittal in (25%), cerebellar convexity with (7.5%), sphenoid ridge location was seen in (10%), the tuberculum sellae was seen in (12.5%) and intraventricular location in 2 cases (5%), while the sub frontal and cerebellopontine angle (C.P.A.) locations shared the same number of cases (one for each) that represent (2.5%) of total cases of meningiomas.

![Figure 2: location of meningiomas](image)

The mean ADC value of atypical meningiomas was 0.61 ± 0.09x 10⁻³ and the mean ADC value of typical meningiomas was 1.22 ± 0.11x 10⁻³. There was a statistically significant difference between the ADC values of typical and atypical meningiomas (P <0.001) (Table 1).

### Table 1: The ADC range and ADC mean of meningiomas

<table>
<thead>
<tr>
<th>ADC range(10⁻³ mm²/s)</th>
<th>ADC mean (10⁻³ mm²/s)±SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>0.73-1.78</td>
<td>1.22 ± 0.11</td>
</tr>
<tr>
<td>Atypical</td>
<td>0.41-0.68</td>
<td>0.61±0.09</td>
</tr>
</tbody>
</table>

Typical meningiomas was variable with 13 hypointense, 10 isointense and 9 slightly hyperintense. While of eight atypical meningiomas, one was isointense, one slightly hyper-intense, and six were hyper-intense signal intensity (Table 2).

### Table 2: Difference in intensity between types of meningiomas

<table>
<thead>
<tr>
<th>ADC map</th>
<th>hypointense</th>
<th>isointense</th>
<th>Slightly hyperintense</th>
<th>Hyper-intense</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>13</td>
<td>10</td>
<td>9</td>
<td>0</td>
<td>32</td>
<td>0.002</td>
</tr>
<tr>
<td>Atypical</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Diffusion-weighted MR imaging had been evaluated as a diagnostic technique in cases of brain neoplasms. DWI is the most important MRI technique that provides information on water diffusion to allow evaluation of the rate of microscopic water diffusion within tissues.

In our study we found female predominant, 77.5% female, 22.5% male, which is go with study of intracranial meningioma by Isabelle, 80% of patients are female in adults, and in other study in workers found female predominant, 66% female, 34% male.

In our study found mean ADC value of meningiomas was 0.97 ± 0.21× 10−3 mm²s⁻¹, Similar results were reported also in the study of Hakyemez et al. found in their analysis of 39 patients with meningioma that the mean ADC value 0.96± 0.22× 10⁻³ mm²s⁻¹(10), while Filippi et al. found that the mean ADC value was 0.77± 0.29× 10⁻³ mm ²s⁻¹.

There were 80% of meningiomas typical presentation and 20% atypical, in other thesis the typical meningioma about 88.7%, atypical meningioma about 11.3% 7, and Herz et al. the typical meningioma was 71%, atypical meningioma was 29% 20. These difference could be according to examiner professional or to criteria used to differentiated between them.

In our study the most common location meningioma is in cerebral convexity and next common location is parasagittal, and percent of intra ventricular meningioma about 5% which is consistence to results of other authors 21,22. Other study had 1.6% of patient diagnosed as intra ventricular meningioma, other result of location approximately coincide to result of study by Watts et al.

Results of this study found that 55% of meningiomas arise in right side of brain and 30% in left side and 15% in central region. These results was in consistent with those obtained by AbdulSattar who found that 53% was in right side, 29% in left side, and 14.5% in central region.

In this study, 15% had bone involvement, which is resembling the result obtained by Bigner (15–20%) 24. Other study reported 14.5% of bony involvement 26. On the other hand, meningiomas calcification seen 12% only while other worker reported 33% 27.

On calculating the mean ADC values we found that the ADC values of atypical meningiomas (0.61±0.09) were significantly lower than those of typical meningiomas (1.22 ± 0.11) in p-value 0.001. Similar results have been noted by several authors. The ADC values of atypical meningioma were lower than typical meningiomas, there are several possible explanations for this observed correlation. One factor is that malignant and atypical meningiomas have less extracellular water and space, which reduces the ADC value. This observation is expected if one considers that primary brain neoplasms, which have been diagnosis, show an increase in extracellular water and space due to cell lysis (less viable and less cellular tumor), and this occur in an increase in the diffusion constant.

Furthermore, the histopathologic features that are unique to atypical meningiomas create a complex, local environment that lead to restrictions on the normal diffusion of water molecules within these tumor.

Our result approved that 32.5% of meningiomas seen as isointense in signal intensity. Hadidy et al. reported that the majority of meningiomas presented with isointense signal 29.

Most typical meningiomas 71.8% are hypointense and isointense, 28.2% are slightly hyperintense on signal intensity. Seventy five % of atypical meningiomas are hyperintense, Filippi et al found that 23% of typical meningiomas were slightly hyperintense while 70% atypical meningiomas had markedly increased signal intensity on DWI 19. Similar result had been revealed by Kono et al.

CONCLUSION

Atypical meningiomas tend to be markedly hyperintense on diffusion-weighted MR images and exhibit marked decreases in the ADC values when compared with normal brain parenchyma. Benign meningiomas appear hypointense and have higher ADC values compared with normal brain. DWIs and ADCs can provide information useful to diagnose brain tumors that cannot be obtained with conventional MR imaging.

Conflicts of Interest: None of the authors have any conflicts of interest relevant to what is written.

Funding source: University funding was provided for: data collection, analysis, and interpretation; trial design; patient recruitment. No public funding was
received.

**Ethical Clearance:** The study was conducted in accordance with the ethical principles that have their origin in the 

**Declaration of Helsinki.** The study protocol and the subject information and consent form were reviewed and approved by a local Ethics Committee.

**REFERENCES**


The Effect of Conditioning Therapy and Model Therapy Toward Pre-School Child Behavior in Tooth Brushing

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ABSTRACT

Children usually tend to brush their teeth only in certain parts of the labial surface of the anterior teeth and the occlusal surface of the lower molars. This study analyzes the tooth brushing habits in children with conditioning therapy and therapy models based on observational learning theory. In this study a sample of preschoolers who brush their teeth incorrectly in Kindergarten Al-Ammin, Jekan Rayadengan. The results showed that there was a change in the level of knowledge, attitude, and behavior of brushing teeth before and after being given a treatment of conditioning therapy and model therapy. The results of the average difference test (t-test) showed that there were significant differences between respondents’ behavior related to knowledge, attitude, and behavior about brushing their teeth before and after being given a treatment of conditioning therapy and model therapy.

Keywords: conditioning therapy, model therapy, behavior, tooth brushing

INTRODUCTION

Children usually tend to brush their teeth only on certain parts that are preferred, namely the labial surface of the anterior teeth and the occlusal surface of the lower molars.1 Caries is still a child health problem so far. The World Health Organization (WHO) in 2010 stated that the incidence of caries in children is still 60-90%. That number is likely to continue to increase because the national Household Health Survey (SKRT) in 1990 was only 70%, but in 2003 it reached 90%. A 5-year-old child is 90% caries-free, realization and the fact that the Indonesian Child Dentist Association (IDGAI) reveals that around 90% of Indonesians experience tooth decay because most people think dental health is not a priority.2

The solution to the low habit of brushing teeth in pre-school children is one way of forming behavior through conditioning therapy. Conditioning therapy aims to get used to behaving as expected. The habit that is expected is the usual child to brush his teeth to prevent the onset of dental disease early. In addition to conditioning therapy, getting used to brushing teeth can be trained through behavioral formation using a model of therapy.

Formation of behavior by using a therapy model is done by giving examples through the behavior of both parents with the hope that their children follow the behavior of their parents. The way to shape behavior according to what is expected is by using a method of behavior formation with conditional therapy (habits) and by using model therapy (example) based on observational learning theory. Thus it is expected that the habit of brushing teeth in pre-school children can be increased and dental disease in children can be minimized.3

MATERIALS AND METHOD

This study uses a type of pre-experimental research: one-group pretest-posttest design. In this experiment presented with several types of treatment and then measured the results. In this study, there was one group that was given treatment namely conditioning therapy and model therapy for preschoolers’ behavior in brushing their teeth. The population in this study were all preschool children in Kindergarten of Al-Ammin Mandawai Street Number 2A, Palangka, Jekan Raya District, Palangka
Raya City. A sample of preschoolers who brush their teeth incorrectly in Kindergarten of Al-Ammin. The number of samples in this study was conducted using a non-probability sampling method with a purposive sampling of 45 people.

**FINDINGS**

**Table 1. The Result of Pre and Post Test of Respondent Behavior in Teeth Brushing of Kindergarten Al-Ammin 2016.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Answer Value</th>
<th>Total</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&gt;60% (&gt;10)</td>
<td>&gt;59% (&lt;9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total %</td>
<td>Total %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Knowledge</td>
<td>3</td>
<td>45</td>
<td>93.8</td>
<td>48 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47</td>
<td>1</td>
<td>2.1</td>
<td>48 100</td>
</tr>
<tr>
<td>2</td>
<td>Attitude</td>
<td>32</td>
<td>16</td>
<td>33.3</td>
<td>48 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>43</td>
<td>5</td>
<td>10.4</td>
<td>48 100</td>
</tr>
<tr>
<td>3</td>
<td>Act</td>
<td>9</td>
<td>39</td>
<td>81.3</td>
<td>48 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47</td>
<td>1</td>
<td>2.1</td>
<td>48 100</td>
</tr>
</tbody>
</table>

**Table 2. The Result of Different T-Test in Knowledge Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>Total Mean</th>
<th>Total SD</th>
<th>P-Value</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>16.25</td>
<td>27.877</td>
<td>4.024</td>
<td>76.25</td>
<td>32.39</td>
<td>0.000</td>
<td>48</td>
</tr>
<tr>
<td>Post test</td>
<td>92.50</td>
<td>13.448</td>
<td>1.941</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the results of research on the behavior of respondents related to the level of their knowledge in brushing teeth, it is known that the average results in the first measurement are 16.2% with a standard deviation of 27.8%. In the second measurement, the average value of the respondent’s knowledge level is 92.5% with a standard deviation of 13.4%. It can be seen from the mean value the difference between the first measurement and the second measurement is 76.25 with a standard deviation of 32.39. From the results of the measurement statistics of 2 variables, the p-value of 0.000 is obtained. So it can be concluded that there is a significant difference between the behavior of respondents related to knowledge about brushing teeth on the first and second measurements.

**Table 3. The Result of Different T-Test in Attitude Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>Total Mean</th>
<th>Total SD</th>
<th>P-Value</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>75.83</td>
<td>14.267</td>
<td>2.059</td>
<td>8.33</td>
<td>25.377</td>
<td>0.028</td>
<td>48</td>
</tr>
<tr>
<td>Post test</td>
<td>84.17</td>
<td>21.421</td>
<td>3.092</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the results of the research on the behavior of respondents related to their attitude in brushing teeth, it is known that the average results in the first measurement are 75.8% with a standard deviation of 14.2%. In the second measurement, the average value related to the attitude of respondents was 84.1% with a standard deviation of 21.4%. It can be seen from the mean value of the difference between the first measurement and the second measurement with a value of 8.33 with a standard deviation of 25.37. From the results of the measurement statistics of 2 variables, the p-value of 0.028 was obtained. So it can be concluded that there is a significant difference between the behavior of respondents related to the attitude in brushing teeth on the first and second measurements.

**Table 4. The Result of Different T-test in Behavior (Act) Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>Total Mean</th>
<th>Total SD</th>
<th>P-Value</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre test</td>
<td>9.31</td>
<td>1.32</td>
<td>0.19</td>
<td>5.31</td>
<td>3.047</td>
<td>0.000</td>
<td>48</td>
</tr>
<tr>
<td>Post test</td>
<td>14.63</td>
<td>2.74</td>
<td>0.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the results of research on the behavior of respondents related to their actions in brushing teeth, it is known that the average results in the first measurement are 9.3 points with a standard deviation of 1.32. In the second measurement, the average value related to the attitude of respondents is 14.6 points with a standard deviation of 2.74%. It can be seen from the mean value of the difference between the first measurement and the second measurement with a value of 5.31 with a standard deviation of 3.04. From the results of the measurement statistics of 2 variables, the p-value of 0.000 is obtained. So it can be concluded that there is a significant difference between the behavior of respondents related to their actions in brushing their teeth on the first and second measurements.

**DISCUSSION**

Based on the results of the study it was found that changes in the behavior of respondents in brushing their teeth after conditioning therapy. Behavioral therapy typically functions as a teacher, director, and expert in diagnosing mal-adaptive behavior and in determining the expected healing procedures, leading to new and adjustive behavior.⁴

If a behavior rewarded, then the probability of reappearance of such behavior in the future will be high. The strengthening principle that explains the formation, maintenance, or elimination of behavioral patterns, is at the core of operant conditioning. The following is a brief description of the operant conditioning methods which include: positive reinforcement, the formation of response, intermittent reinforcement, deletion, piloting, and token economy.⁵

Positive reinforcement is the formation of a behavior pattern by giving rewards or reinforcement as soon as the expected behavior arises.

Response formation is the behavior that is now gradually being changed by strengthening the small elements of the desired new behavior in a row until it approaches the final behavior.

Intermittent reinforcement, given varied to specific behavior.

Abolition is on the basis that if a response is continuously made without reinforcement, then the response tends to disappear.

Modeling, the method by observing a person then exemplify the model’s behavior.

Economic tokens, the token economy method can be used to shape behavior if other untouchable agreements and powers do not influence.

The involvement of targets in the implementation of behavioral therapy is very calculated. With the existence of a cooperative working relationship and of course a proper communication process, this behavior therapy activity can be directed towards achieving common goals.
Communication is indeed the most fundamental thing for humans as living beings. Humans always interact with communication not only with fellow human beings as social beings, but more than that human also communicates with themselves, with God, and the universe. Through this communication process, humans share information, feelings, and experiences continuously until there is a specific agreement or outcome, called the communication effect.

Operant conditioning is a therapy that is applied in a learning system that is carried out by translating the target’s general purpose into a goal in the form of specific behavioral changes desired by the target, which is intended to find problem solving from the cognitive, affective, and psychomotor behavior of the target conduct instructional communication in the form of eliminating non-adaptive learning outcomes and providing adaptive new learning experiences.4

Based on the results of the study it is known that the behavior changes of respondents in brushing their teeth after the model therapy. Basic modeling is a social learning theory developed by Albert Bandura (1967). This theory accepts most of the principles of behavioral learning that have been discussed in the two discussions above but gives more emphasis on the effects of signals on behavior and internal mental processes.6

Modeling is one of the applications of social learning theory in the formation of individual behavior. Suppression of the effects of the consequences on the behavior and ignores the modeling phenomenon that mimics the behavior of others and experiences vicarious, i.e., learn from the successes and failures of others.

Participant modeling is a behavior modification strategy through observing behavior towards the model. One type of modeling is modeling strategies for participants. Modeling participants a treatment approach based on social learning principles and rated coined effectiveness in helping to address the problem of violence on a child’s parents in everyday life.7 In the participant modeling treatment, there appears to be an effect of changing the behavior of parents to their children, especially in the case of single parents. The research about sexual abuse prevention program in children with modeling techniques participants. Generate positive attitudinal changes to children’s and parental skills in reporting and preventing sexual harassment compared to modeling programs symbolic.8

Modeling participants emphasized the in vivo performance on tasks that are feared, with consequences that are raised by the successful performance which is considered as a means for psychological changes.9 Modeling is a strategy used to shape new behavior, improve skills or minimize behavior that is avoided. Modeling is involving the addition and reduction of behavior observed behavior, generalizes various observations at once, involves cognitive processes.6

From the description above, it can be concluded that participant modeling is new behavioral learning methods through observation of a person model, adding information through cognitive processes and will produce behavioral changes according to the modeled. Participants or models must have the expected criteria or behavioral characteristics according to the desired behavior. In this study, the expected behavior change is compliance in undergoing a therapeutic regimen program.

There are four essential components of participant modeling. (1) Rational, that is by seeing, practicing with guidance and will perform abilities independently. This is aimed at helping client difficulties. (2) The demonstration of the model. The model will pattern, and repetition is needed. (3) Guided participation. The client is given the opportunity to practice the behavior observed with guidance and is the essential component of learning to overcome a frightening situation to obtain new behavior. (4) Successful (strengthening) experiences. Clients will experience success from what they have learned; this is a reinforcement of the behavior that has been learned.10

CONCLUSION

There is a significant difference between respondents’ behavior regarding knowledge, attitudes, and behavior about brushing teeth before and after being given a treatment of conditioning therapy and model therapy.

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Polytechnic of Health, Ministry of Health, Republic of Indonesia, Palangka Raya
to determine that this study has met the feasibility. Information on an ethical test that the study is eligible to continue. The feasibility of the research was conducted to protect the human rights and security of research subjects.

**Source Funding:** Self-funding from the authors did this study.

**Conflict of Interest:** The authors declare that they have no conflict interests.

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Factors Related to Blood Glucose Levels among Type II Diabetes Mellitus Patients (A Cross-Sectional Study in Kedungmundu Public Health Center, Semarang)

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¹Department Epidemiology and Tropical Diseases, Faculty of Public Health, ²Department of Biology, Faculty of Sciences and Mathematics, ³Master Program of Epidemiology, School of Postgraduate Studies, ⁴Department Epidemiology and Tropical Diseases, Faculty of Public Health, Diponegoro University, Semarang, Indonesia

ABSTRACT

Diabetes mellitus (DM) is a disease that require continuous treatment and management in order to prevent complication. The aim was to determine DM in adult outpatient and to analyze correlation between some factors with blood glucose level in diabetes mellitus patient. The method was observational with cross-sectional study design. The amount of sample was 200 subject, all adult outpatient of Kedungmundu Health Center from May-August 2018 and willing to be tested and interviewed, selected by total sampling. Data were collected through interview with questionnaire and measurement of fasting blood sugar. We conduct univariate, bivariate and multivariate analysis. The result of research showed that 173 out of 200 respondents were diabetes mellitus, 60% respondents had an uncontrollable blood glucose level. Furthermore multivariate analysis showed that there was correlation between duration of diabetes, medication adherence, physical exercise level, type of physical exercise, duration of physical exercise and family supports with blood glucose level. It is suggested to give education not just for diabetic patients but also to the closest family of diabetes mellitus patient. DM patients suggested to do regular physical exercise with duration more than 90 minutes/weeks and increase the medication adherence to prevent the complication of the disease.

Keywords: diabetes mellitus, medication adherence, physical activity, blood glucose level

INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease that occurs when the pancreas does not produce enough insulin or alternatively when the body cannot use the insulin effectively. Type 2 diabetes mellitus is the effect of impaired insulin secretion.¹ Results of Basic Health Research, Ministry of Health of the Republic of Indonesia in 2007 stated that 6.9% of the Indonesian population suffered from Diabetes Mellitus, 69.6% of which were undiagnosed. While in 2013 there were 5.7% of patients but the increase of undiagnosed DM patients become 73.7% were happened.² The prevalence of Type 2 DM in Semarang was 27%.³ Kedungmundu Health Center is one of the health centers with the largest DM cases in the city of Semarang with a proportion of cases of 30.3% in 2015.

The proportion of DM in Kedungmundu Health Center is higher than the proportion of cases of DM in the city of Semarang. DM is characterized as chronic hyperglycemia which is drag the patient to the vasculature injury.⁴ Management of blood glucose level is known to play important role in preventing diabetes complications.⁵ Although the management of blood glucose levels has proven to be a factor that prevents complications of DM patients, previous studies reported that 60% of DM patients had poor blood glucose control.⁶ This research wants to know the contributing factors related to the management of blood glucose...
levels among DM Type 2 patients in Kedungmundu Health Center, Semarang.

METHOD

This research is a quantitative research with observational analytic type. The study design used in this study is a cross sectional study design. This research was conducted from May to August 2017 in the work area of Kedungmundu Health Center Semarang. The population in this study were all outpatients who visited the Kedungmundu Health Center from May to August 2018 and willing to be tested and interviewed as much as 200 subjects. The sampling technique used is total sampling technique. Then, subject with positive DM result for blood glucose screening interviewed using questionnaire (173 subject). Variable dependent consist of the blood glucose levels, while independent variable consist of the duration suffered diabetes, obesity, physical activity, frequency of physical exercise, dietary compliance, medication adherence, family support, and motivation levels. The data obtained were then analyzed univariate, bivariate and multivariate to know the contributing factors of blood glucose levels.

RESULTS AND DISCUSSIONS

From 200 person who visited Kedungmundu Health Center, 173 of them diagnosed as DM Type 2. The results showed that most of the respondents are female (76.9%), aged 50-64 years (64.7%), working as housewife (66.5%). This result is in line with the study conducted by Ruhembe et al in Tanzania, found most of the respondents are female (60.8%), not working (38.93%), aged 30-40 years (43.84%).

Table 1 The characteristic of the respondents (n=173)

<table>
<thead>
<tr>
<th>Characteristic respondents</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>133</td>
<td>76.9</td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>23.1</td>
</tr>
<tr>
<td>Age</td>
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<tr>
<td>36-49 years</td>
<td>29</td>
<td>16.8</td>
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<tr>
<td>50-64 years</td>
<td>112</td>
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<td>&gt;64 years</td>
<td>32</td>
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<tr>
<td>Occupation</td>
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<tr>
<td>Retired</td>
<td>21</td>
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</tr>
<tr>
<td>Housewife</td>
<td>115</td>
<td>66.5</td>
</tr>
<tr>
<td>Non-government employee</td>
<td>10</td>
<td>5.8</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>11</td>
<td>6.4</td>
</tr>
<tr>
<td>Labors</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td>Others</td>
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<td>6.4</td>
</tr>
</tbody>
</table>

Our study revealed that most of the respondents have uncontrolled blood glucose level (60.1%), more than half of them are diagnosed DM for less than 2 years ago (50.3%), obese (51.4%), and take the medication regularly (50.9%). There are 70.5% of them have mild psychical activities, usually they are walking (43.4%) with the frequency within 1 weeks <90 minutes (62.4%). They have high motivation levels (54.3%), more than half of them get family support (54.3%), and about three quarters of them (77.5%) are not adhere to do healthy DM diet.

This result is line with previous study conducted in Saudi Arabia found that 80.6% respondents are not following the meal plan, 69.1% high adherence in taking medication, 58% high adherence to do exercise. While study conducted in Brazil found that 55.8% respondents don’t get insulin treatment, with irregular dietary control (74.4%), and 82.2% of them are don’t have dietary guidance.

Table 2 The distribution of variables in DM patient (n=173)

<table>
<thead>
<tr>
<th>Characteristic respondents</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blood glucose levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled</td>
<td>69</td>
<td>39.9</td>
</tr>
<tr>
<td>Uncontrolled</td>
<td>104</td>
<td>60.1</td>
</tr>
<tr>
<td>2. Duration of suffered DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>86</td>
<td>49.7</td>
</tr>
<tr>
<td>&lt;= 2 years</td>
<td>87</td>
<td>50.3</td>
</tr>
<tr>
<td>3. Obesity status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>89</td>
<td>51.4</td>
</tr>
<tr>
<td>Overweight</td>
<td>37</td>
<td>21.4</td>
</tr>
<tr>
<td>Normal</td>
<td>47</td>
<td>27.2</td>
</tr>
<tr>
<td>4. Medication adherence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhere</td>
<td>88</td>
<td>50.9</td>
</tr>
<tr>
<td>Not adhere</td>
<td>86</td>
<td>49.1</td>
</tr>
<tr>
<td>5. Physical activities level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>30</td>
<td>17.3</td>
</tr>
<tr>
<td>Mild</td>
<td>122</td>
<td>70.5</td>
</tr>
<tr>
<td>High</td>
<td>21</td>
<td>12.1</td>
</tr>
<tr>
<td>6. Type of physical activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivity</td>
<td>57</td>
<td>32.9</td>
</tr>
<tr>
<td>Walking</td>
<td>75</td>
<td>43.4</td>
</tr>
<tr>
<td>Gymnastic</td>
<td>34</td>
<td>19.7</td>
</tr>
<tr>
<td>Jogging</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Cycling</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td>7. Frequency of physical activities 1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;90 minutes/ week</td>
<td>108</td>
<td>62.4</td>
</tr>
<tr>
<td>≥90 minutes / week</td>
<td>65</td>
<td>37.6</td>
</tr>
<tr>
<td>8. Family support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Supported 92 53.2
Not supported 81 46.8

9. Motivation levels
Low 79 45.7
High 94 54.3

10. The adherence of diet
Adhere 39 22.5
Not Adhere 134 77.5

From table 3 revealed that the duration of DM, medication adherence, physical activities level, type of physical activities, frequency of physical activities in one week, and the family support were significantly associated with the levels of blood glucose among type 2 DM patients (p value <0.05).

Table 3. The contributing factors associated with blood glucose levels among patients type 2 DM in Kedungmundu Health Center

<table>
<thead>
<tr>
<th>Variables</th>
<th>Blood glucose status</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncontrolled</td>
<td>Controlled</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Duration of suffered DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>53</td>
<td>61.6</td>
</tr>
<tr>
<td>&lt;= 2 years</td>
<td>51</td>
<td>60.1</td>
</tr>
<tr>
<td>Obesity status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>44</td>
<td>49.4</td>
</tr>
<tr>
<td>Overweight</td>
<td>34</td>
<td>91.9</td>
</tr>
<tr>
<td>Normal</td>
<td>26</td>
<td>55.3</td>
</tr>
<tr>
<td>Medication adherence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhere</td>
<td>68</td>
<td>52.7</td>
</tr>
<tr>
<td>Not adhere</td>
<td>36</td>
<td>81.8</td>
</tr>
<tr>
<td>Physical activities level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>76.3</td>
</tr>
<tr>
<td>Mild</td>
<td>78</td>
<td>63.9</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>Type of physical activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivity</td>
<td>29</td>
<td>50.9</td>
</tr>
<tr>
<td>Walking</td>
<td>56</td>
<td>74.7</td>
</tr>
<tr>
<td>Gymnastic</td>
<td>14</td>
<td>41.2</td>
</tr>
<tr>
<td>Jogging</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Cycling</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>

This results are similar with the previous study, found that the duration of diabetes is strongly associated with the glycemic control in patients living with type 2 DM.10 Another study conducted by Rasheed et al revealed regular exercise is significantly related to the decrease of blood glucose level into normal range among DM patients.11 Type of aerobic exercise such as cycling, walking and jogging affect the blood glucose, it tends to decline and increase the sensitivity of insulin.12 The intensity and duration of physical exercises play important role on the glycemic control through glucose production shifts from hepatic glycogenolysis to enhanced gluconeogenesis as duration increase.13 Support family is also related with glycemic control for people living with diabetes. This result is similar to those reported by Strizich who found that people with low family support are likely to have uncontrolled diabetes (OR =2.31; 95%CI:1.17-4.55).14 Medication adherence also play important factors in glycemic control, the previous study revealed those with high adherence to oral hypo-glycemic medications were less likely to have poor glycemic control (OR=0.54; 95%CI:0.50-0.59).15,16

CONCLUSIONS

From 173 of 200 adult outpatient of health center were diabetes mellitus, 60% respondents of DM subjects had an uncontrollable blood glucose level and there was
correlation between duration of diabetes, medication adherence, physical exercise level, type of physical exercise, duration of physical exercise and family supports with blood glucose level.

**Conflict of Interest:** The author reports no conflicts of interest in this work.

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**Ethical Clearance:** Ethical clearance was obtained from Ethic Commission of Health Research, Faculty of Public Health UNDIP (094/EC/FKM/2018). All subjects signed informed consent to join the study.

**REFERENCES**

Developing a Hospital Electronic Death Record and Storage System for Deceased Patients in Developing Countries

Alfred Coleman

Associate Professor and Chair of Department School of Computing, University of South Africa, South Africa

ABSTRACT

Filling and storing the data of deceased patients by hospitals has been influenced by African cultural beliefs for decades. This research paper investigated the current practices of filling and storage of deceased person’s data by hospitals. The study employed a case study approach in collecting data. Data was collected using semi-structured open ended interviews. It was revealed that the current practices involved paper filling and storage of dead patients’ records and issuing of hand written death certificates. This resulted in time delays, errors in completion of the death certificates leading to pricey amendments and lengthy litigation in courts. The findings lead to the proposal of Framework for Hospital Electronic Death Record and Storage System (FHEDRSS) for developing countries to save time and effort, allowing error correction and enhanced accuracy, improving turnaround time for procuring certified copies of death certificates and protecting the archived documentations and the death certificates for many years.

Keywords: African Culture; Paper Health Records; Electronic Health Records; Death Certificate.

INTRODUCTION

Much has been written about electronic health record (EHR) system in healthcare environment. The functions of the EHR have been categorized into two main components; the direct health care functions and supportive health care function. Direct care EHR functions enable delivery of healthcare and offer clinical decisions support. For example, when a patient shows the symptoms of common cold, the direct care EHR function will enable the physician to record that event and provide clinical decision-support advice. The direct care function within EHR section will respectively offer legitimate prescription and alert for the medication given to the patient who has the symptoms of a cold. On the other hand, the supportive function within the EHR system assists with the administrative and financial requirements associated with the delivery of healthcare. Also, the EHR provides inputs to other sub-systems that perform functions like medical research and public health promotion.

Many state hospitals in developing countries (for example, South Africa) have some sort of sub-systems for delivery of healthcare services. However, one system which is not found as an integral part of the sub-systems within the hospitals is the electronic death record and storage system. Electronic death record and storage system is an electronic system that keeps all the files, death records and death certificates of the deceased person. It is an online collaboration system that links multiple service providers to access and use the electronic documentation.

In developing countries like South Africa and other African countries, it is embedded in their cultural beliefs that those who are dead are alive in a different world and can reincarnate (that is, return to this world) in new births. Death is considered a rite of passage for those who die at an acceptable (old) age. In cases of death occurrence in Africa, divination is many times resorted to, and the cause of death is determined from consulting dead ancestors and usually attributed to spiritual factors (witchcraft, offending one’s ancestors, or Gods) rather than medical or physical reasons. Therefore, registering and storing the records of the dead person is done with sensitivity and fear of curse among Africans. The process usually done by paper records keeping. However, in contemporary African societies today, data about the dead person is needed for issuing of death certificate, which must be completed accurately and promptly since
these documents are needed for administrative and public health purposes. It is also needed by family members of the deceased to resolve estate and insurance policies of that dead person.

The problem is, the use of paper record for filing and storing of dead person’s record increases the time of filling and the time to receive death certificates in this contemporary Africa. The paper records also compromise the quality of data sometimes received as the cause of death.

Therefore, the purpose of this research paper is to investigate the current practices of filling and the storage of the deceased person’s data in hospitals. From the outcome of the investigation, an electronic death, record and storage system framework will be proposed for the hospitals.

The remaining sections of this paper are structured as follows; related work, methodology, results and discussion, and finally the proposed framework and conclusion.

Related Work

Paper Verse Electronic Health Records

This section elaborates on the differences and importance between paper health records and electronic health records (EHR). Electronic Health Record (EHR) is an electronic record of all health-related events for a person before birth and till death (womb-to-tomb health record!)\(^8\).

With the definition and coverage of EHR, essential differences exist and have been identified between paper health records and EHR, in terms of location, readability, accessibility, traceability, supported care process and data self-sorting. All the stated attributes are better with electronic records keeping 9,2.

Due to the differences, the advantages offered by EHR over paper health records can be easily recognized. Patient health records with EHR are no longer restricted to the data generated within their local healthcare establishment. Data about the health history of patients and their current health status will be presented in a coherent and legible way. Secondly, access rules can be made explicit and strictly adhered to. Thirdly, the care process can be supported in a logistic sense, for example, physician order entry, appointments, as well as protocols and guidelines used to support the behavior and decision-making of healthcare professionals can be supported by the electronic documentation. Moreover, EHR is viable for 24-hour access. Data self-sorting, loss avoidance of records (dependent on resilience) and audit trail of document use are all benefits the EHR provides (Suomi 2006). All of these superiorities of EHR support modern healthcare practice by providing multiple functions, such as evidence-based healthcare\(^{10}\) and increasingly efficient medical practices \(^{11}\).

METHODOLOGY

In order to achieve the objectives of this paper, the researcher carried out the study in the North West Province of South Africa. Five government owned district hospitals in the North West Province of South Africa were purposefully selected. The hospitals were selected considering their geographical locations, which spans across the entire province and the high number of patients served. The participants for the study were drawn from the population of doctors in the five hospitals. Two doctors from each of these hospitals were selected based on their professions. The ten selected doctors offered to partake in the study. Data was collected using semi-structured open ended interviews.

The interviewees were required to answer these questions in their own words:

1. What is the current practice of completing death certificates for deceased patients?
2. How do you file and store the death certificates?
3. Who are the beneficiaries of the death certificates?

The interviews lasted for one hour with each interviewee and were audio-recorded and transcribed by the researcher. The integrity of data entry from the study was checked by another independent researcher. The transcripts were coded using Wolcott’s\(^{12}\) method of case study analysis techniques. The main researcher and an independent researcher met to check the consistency of their interpretation after the initial coding. The researcher then coded the final transcripts, identified the main themes, and outlined likely relationships. Some broad categories of themes were identified by searching for patterns in the participants’ responses. The different broad categories that were noted are discussed below.
RESULTS AND DISCUSSION

Current Practice of Completing Death Certificate

The respondents indicated that if a person dies of natural causes in the hospital, the doctor will issue a death notice also known as the BI-1663 Medical Certificate. The doctor fills in the forms, indicates the cause of death, signs it and issue it as an immediate medical certificate. Hospitals which do not have mortuary facilities, a funeral undertaker or director is contacted right away to collect the deceased body. State hospitals usually have mortuary facilities; therefore, the body remains there until a death notice is issued.

On the other hand, if a person dies at home of natural causes, someone contacts the doctor or the hospital first. The funeral director can be contacted to transport the deceased to a mortuary, provided the doctor is willing to issue a death notice. A death notice is issued from the deceased’s doctor who must have seen the deceased within twenty-four hours of their death or within a judicious time whereby the doctor is certain of the cause of death. If the doctor declines signing the death notice, a private autopsy will be arranged by a funeral service to determine the cause of death. In this case, the pathologist at the mortuary where the autopsy is performed will issue the death notice.

For patients who die of natural causes at home and do not require an autopsy, there is a further requirement if they are to be cremated. Another doctor will need to inspect the body to establish that there is no reason why the body cannot be cremated. Both doctors then sign the cremation forms, and the forms are thereafter given to the medical referee at the crematorium, who then gives the last authorization for the cremation to take place.

Furthermore, if a person dies at home of unnatural causes, the police is first contacted. The police will organize removal of the body to a state mortuary where a compulsory autopsy will be performed and a death notice will be issued.

In all the cases above, a relative or friend identifies the body before the death notice can be issued.

Filling and Storage of Death Certificates and Previous Medical Records of the Deceased

The doctors indicated that the deceased records must be kept as direct evidence in case litigation arises in the future. The doctors reiterated that all documents of the deceased patients are kept in a paper form including any written notes taken by a healthcare practitioner thus, referral letters to and from other healthcare practitioners, laboratory reports, laboratory evidence such as, cytology slides, autopsy reports and death certificates and any other forms completed during the health interview with the deceased. The problem associated with the paper documentation is that such documentation can be viewed only at one hospital or location. Bakker emphasizes that paper documentation stored in one health facility prevent other facilities and most especially other higher authorities from viewing such documents. It gives room to people who access one document to access all other data therefore; the use of electronic records will grant different levels of authorization of access to digital data. The issue of traceability of a file was raised by the doctors as a problem with paper documentation. You cannot trace who has seen the paper document or has handled it before. It is impossible to record who has seen the data and the last time the file was seen and used. Suomi states that it is easier to keep and audit trial of these documents using electronic filling and storage system. It was further stated by the doctors that the head of the district hospital appoints a designated record manager. The record manager keeps a paper trail of every deceased person and stores them in the storage room.

Beneficiaries of Deceased Death Certificates and Cause of Death of the Deceased

On the question of who benefits from the death certificate and stored documents of the deceased, the doctors indicated that the families of the deceased person are the first beneficiary of the death certificate if issued on time. The families need this for burial preparation of the deceased. Again they need it for taking over the estate of the deceased. The respondent also indicated that doctors, and other healthcare providers need it to justify the cause of death should it happen that issues of police and legal litigations crop up. Therefore, an electronic system of filling and storing of the deceased data is of curial importance. It makes the processing of information about the deceased fast and error free.

Other beneficiaries like funeral undertakers obtain the death certificate and plans the wake and funeral with the family. Therefore, paper processing of such documents may delay the process.
The Need for a Framework for Hospital Electronic Death Record and Storage System (FHeDRSS) for Developing Countries

Based on these findings, the researcher proposes a hospital electronic death record and storage system for deceased patients to save time and effort in filling and storing of data for the deceased. The proposed framework will eliminate errors made by doctors and enhance accuracy. It will also improve the turnaround time for procuring certified copies of death certificates.

The system will be a web based system which will function as follows.

The hospital will notify the department of home affairs about the facts of death and verify the deceased’s identity number; Analyze the deceased’s electronic medical record for potential causes of death; Code cause of death and identifying incomplete, insufficient, or illogical causes of death; Automatically identify and transmit information about death due to specific cases of public health importance to the appropriate state and national agencies; Verify, standardize and geocode addresses for deceased person (address cleansing); Facilitate exchange of information among EHRs, funeral home information systems (FHIS), and medical examiner information systems (MEIS); Provide medical certifiers - including medical examiners and funeral undertakers to access deceased electronic medical records for determining cause of death; Exchange electronic death records between jurisdictions for non-resident deaths; Exchange electronic death records between death registration jurisdictions and department of health.

![Fig. 1. Proposed framework for hospital electronic death record and storage system (FHeDRSS) for developing countries](image-url)
When the patient dies in hospital, the doctor checks the patient health record system and certifies the cause of death. He issues B1-1663 cause of death certificate to the family member. The cause of death documentation together with all the medical records are stored in the hospital’s HER server. The cause of death documentation that has been endorsed by the medical doctor is forwarded to the Department of Home Affairs. The Department of Home Affairs stores the documents in a “Fact of death files” database and issues actual death certificate to the funeral undertaker or funeral director upon request from the funeral undertaker. The legal registration office requests for a copy of the death certificate and it is sent to their office and stored in their database. Should the death have occurred through an unnatural cause and outside the hospital, the police information system must have a copy of the death certificate for storage in the police information database system.

**CONCLUSION**

This paper examined the process of filling and storing data of deceased patients in hospital. The paper further investigated how death certificates are processed and issued upon the death of a patient. The investigation unearthed the current practices of paper filling and storage of dead patient’s records, and issuing of handwritten death certificates results in time delays, errors in completion of the death certificates leading to pricey amendments and lengthy litigation in courts. In addition to these, long storage of documents renders some of the document destroyed and difficult to trace after 50 years.

The findings lead to the proposal of the Framework for Hospital Electronic Death Record and Storage System (FHEDRSS) for developing countries which will save time and effort, allow error correction and enhanced accuracy; improve turnaround time for procuring certified copies of death certificates and protect the archived documentations and the death certificates for many years.

**Conflict of Interest:** None

**Ethical Clearance**- Taken from UNISA ethics committee

**Source of Funding**- Self.

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Sexually Transmitted Viral Infections Involving the Genitalia among Females in Nassiryia; a Clinical & Histopathological Study

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ABSTRACT

Background: Sexually transmitted infections (STIs) caused by viruses, are among the most prevalent infectious diseases worldwide and a major cause of morbidity and mortality, better understanding of these diseases may be critical for their prevention.

Objective: To shed light on the main sexually acquired viral infections in women in Nasiriya city.

Method: A cross sectional study was done in the period from April 2016 till April 2017, females of all ages attending the outpatient dermatology department in Al Hussain teaching hospital in Nasiriya; south of Iraq; having dermatoses in the genital area that were diagnosed to be viral infections were included in the study.

Results: A total of 260 female patients from all ages were seen & examined during the study period, the highest number (131) was among patients with molluscum contagiosum; among whom there were 28 baby girls with uncertain sexual mode of transmission, followed by genital warts (108) & the least were patients with herpes simplex (21).

Conclusion: viral STI’s in women are important yet neglected diseases as most patients feel shy & postpone medical consultation, leading to delayed diagnosis & in many instances grave consequences.

Keywords: female, genital, infective, sexually transmitted infections (STIs).

INTRODUCTION

Sexually transmitted infections (STIs) are a major global cause of acute illness and infertility, with severe medical and psychological consequences for millions of men, women and infants. (1) Genital dermatoses are very common, but usually under diagnosed because of the embarrassment associated with it, many women were brought up with the prevailing cultural taboos about the female genitalia and are members of the “down there” generation where almost no words are spoken to refer to the female genitalia, internal or external. (2)

The burden of STIs rests predominantly with the youth of society. (3,4,5) The majority of young women initiate sexual activity during adolescence, (6) and the risk for sexually transmitted infections (STIs) accompanies this initiation. (3)

Sexually transmitted diseases (STDs) have long been known to cause acute pathological syndromes, such as genital secretion and ulceration. However, they only recently have come to be considered significant causes of long-term morbidity, this is principally due to the large amount of information that has been collected about a group of agents that cause these diseases: the viruses. (7) After the association between virus and ano-genital cancer was established, viral STDs began to be recognized as important diseases that influence the health of women and breastfeeding infants, as well as
reproductive health. (8)

In Iraq, in spite of the conservative nature of the society, & the prevailing rule of no sex before marriage; the tendency towards early marriage exposes adolescent females to the same consequences of early exposure to sex & increasing number of STI’s mainly viral seen daily in medical practice, & since these carry long-term health consequences, some of which are serious and life threatening, this study was designed to focus on the main risk factors & modes of transmission for better understanding & prevention of these diseases.

Patients & methods: A prospective cross sectional study was done, the patients included were females of all ages who were diagnosed to have viral infections involving the genital area.

Patients were seen & examined during the period from 1st April 2016 till 1st April 2017. A careful detailed history was taken from all patients, regarding age, marital status, pregnancy, their chief complaint, its duration, menstrual, obstetric & contraception history, history of sexual exposure & partner affection, personal or family history of diabetes or any systemic illness or skin disorders as atopy or psoriasis & a detailed drug history of the type of treatment used & whether this treatment has led to improvement or worsening of the condition.

A thorough physical examination of affected skin was done, together with examination for lesions elsewhere in the body. Clinical diagnosis was enough most of the time, still some patients needed further investigations like mycological (KOH mount), bacterial (Gram’s stain & culture), hematological, serological, biochemical tests, & biopsy in selected cases.

Patients without visible skin lesions were excluded from the study (hepatitis ABC, & HIV).

A verbal consent was taken from all patients included in the study, together with a written consent from patients whose photographs were included in the study.

RESULTS

Two hundred sixty female patients were seen & examined during the study period, of (31.64) years mean age ± 14.238 SD.

Table one shows that molluscum contagiosum was the highest proportionally estimated disease among studied population (50.4%) followed by genital warts (41.5 %)

Table (1): the prevalence of viral infection in the study population

<table>
<thead>
<tr>
<th>Dermatosis</th>
<th>Number</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genital warts</td>
<td>108</td>
<td>41.5%</td>
</tr>
<tr>
<td>Molluscum Contagiosum</td>
<td>131</td>
<td>50.4%</td>
</tr>
<tr>
<td>Herpes simplex</td>
<td>21</td>
<td>8.1%</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure one shows a very high significant statistical association between the durations of the different infections that were transmitted sexually before seeking medical advice and its occurrence, where F. E=308, P value= 0.0001

Figure 1: the duration of the viral STIs before seeking medical advice

Table two shows the main characteristics of the patients in the study, like the age range; where the highest prevalence (28.2%) was among the 20-29 years’ age group, & nearly half of the reported cases were less than 30 years old.

Regarding the marital status, except for baby girls, there was a very high significant statistical association between the marital status and the diagnosis, as the majority (78.2%) were married women & the P value was higher than 0.05.

No significant statistical association was found between pregnancy & the risk of viral STIs, the same was true for contraception use where the P value was less than 0.05 for both.
Nearly equal prevalence was found for both married women whose partner was affected (51.7%) & those whose partner was not (48.3%).

The majority of the patients (83.8%) were healthy with only 10% had associated diabetes.

**Table 2: Distribution according to patient’s characters.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>X2</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10 years</td>
<td>28, 10.82%</td>
<td>28</td>
<td>28.394</td>
</tr>
<tr>
<td>10-19 years</td>
<td>32, 12.3%</td>
<td>48</td>
<td>0.0001</td>
</tr>
<tr>
<td>20-29 years</td>
<td>73, 28.2%</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td>43, 16.6%</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td>53, 20.5%</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td>23, 8.5%</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>60&amp; or more Marital status</td>
<td>8, 3.1%</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Baby girls</td>
<td>28, 10.82%</td>
<td>27</td>
<td>50.021</td>
</tr>
<tr>
<td>divorced</td>
<td>4, 1.7%</td>
<td>8</td>
<td>0.0001</td>
</tr>
<tr>
<td>Not married</td>
<td>23, 8.5%</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Widow</td>
<td>2, 0.78%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>203, 78.2%</td>
<td>299</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not</td>
<td>182, 89.7%</td>
<td>372</td>
<td>0.250*</td>
</tr>
<tr>
<td>Pregnant</td>
<td>21, 10.3%</td>
<td>35</td>
<td>0.617</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>203</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contraception use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>165, 81.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38, 18.7%</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>203</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Partner affection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>105, 51.7%</td>
<td>98, 48.3%</td>
<td>203</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Co-morbid conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>26, 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anemia</td>
<td>10, 3.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>6, 2.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>218, 83.8%</td>
<td>260</td>
<td></td>
</tr>
<tr>
<td><strong>total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Sexually transmitted infections (STIs) caused by viruses, are among the most prevalent infectious diseases worldwide and a major cause of morbidity and mortality. They are preventable, but unlike bacterial STIs the person may harbor the virus in her or his body.
for life with periodic recurrences of active infection (10).

Women have a higher prevalence rates of STIs than men (11), it is estimated that females are three times more likely to be diagnosed with a new STI, (12) that is why it is important to understand the gender-specific differences in STIs in order to develop preventive strategies for these diseases.

Most of the patients 131(50.4%) in the present study; had molluscum contagiosum(MC), but if we exclude the number of baby girls (28) with uncertain sexual mode of transmission, then the actual number would be 103(39.6%), genital warts constituted (41.5%), & herpes genitalis ( 8.1%), in the literature; genital warts (condylomata acuminate) are still the commonest STI, (13) also in Ireland they accounted for 34.1% of STIs reported in 2005. (14) while other reports claim that herpes genitalis is the most common STI in the world, (2)

We did not come across any report of molluscum contagiosum being the commonest STI, this higher prevalence might be explained by the higher prevalence of molluscum contagiosum in general in our society, a cross-sectional study in Iraq showed that MC virus infection represents (8.9%) from all dermatological patients who visited Al-kindly Teaching Hospital over the six months’ study period.

Also, 52.5 % of dermatological infections were MC, it was high percentage in comparison to other dermatological infectious disease (15). This increase in MC infection may be explained by overcrowding and large Iraqi families; a lot of people were grouped together during social and religious events using same towels and beds, which can encourage spreading the virus by direct skin to skin contact (16) as the virus is reported to be more common in warm countries with a high population density. (13)

The lower presentation of herpes genitalis in the study might be due to the fact that most recurrent episodes of herpes simplex genitalis are either asymptomatic or have mild symptoms (17) which does not necessitate medical consultation.

There was a very high significant association between the duration of the illness before consultation; 72.5% of patients with Molluscum contagiosum sought medical advice in less than 2 months' duration, compared to 66.6% of patients with condylomata acuminate, while all patients 100% with herpes genitalis presented with 1 week or less history, this might be attributed to the severe pain & dysuria accompanying this condition (18,19) on the contrary to the asymptomatic behavior of both molluscum contagiosum & condylomata acuminate.

Delays between the onset of symptoms and reaching a definitive diagnosis of problems involving the genital area were reported in the literature to be between 18 months to 10 years, (20) due to facts related to embarrassment or fear of a grave diagnosis as genital skin symptoms often trigger concerns of poor hygiene, sexually transmitted infections, or undiagnosed cancer. (21)

This earlier reporting to health care in this study might be explained by the fact that most of the patients were married with an easier access to health care providers, adding to the presence of almost free health services to women in antenatal clinics.

More than 40% of the patients were less than 30 years of age (excluding the 10.8% baby girls), with 12.3% adolescents, this is not at variance with the literature, in Ireland, the burden of STIs rests predominantly with the youth of society & approximately 50% of new diagnoses are in young people under the age of 25 years (12), another study in 2010 showed that almost 75% of STI diagnoses occurred in individuals aged less than 29 years and 12.7% were in those aged less than 19 years, (22) in USA the adolescents represent at least one-quarter of individuals infected with STIs while two-thirds of STIs occur in those aged under 25 years, (3) The situation is similar in Australia, where over 25% of chlamydia infections in 2011 were in those aged less than 20 years (23).

This resemblance in the results despite the big difference in the social behavior between the societies might be related to the earlier age of marriage in the population of the study as pre-marriage sex is not practiced.

Excluding the children in the study, 78.2% of the patients were currently married, table (2 ), this is a very significant association with P value more than 0.05, & is in accordance with the literature of the increased ratio of STIs with sex exposure (24,25,26) which in the patients included in the study coincides with marriage.

On the contrary, there was no significant association with pregnancy or the use of contraception, with P value
Children constituted (10.82%) of the patients with genital & perianal lesions of MC, they are unlikely to be sexually transmitted as reports have confirmed that genital and perianal lesion can develop in children and are rarely associated with sexually transmission in this population. (27,28)

No significant difference was found between married women whose partners were affected (51.7%), or not (48.3%), a lot of reports in the literature focus on the relation between the age of the sexual partner & the acquisition of STI, adolescent girls with older male partners are at increased risk of sexually transmitted infection, the importance of this association in young adults is unclear. (29) Having multiple partners on the other hand was positively associated with a diagnosis of bacterial infection but not viral infection. (30)

The majority of the patients (83.8%) were otherwise healthy, only a minority had hypertension, anemia & diabetes,

Smoking, alcohol and drug are regarded as markers of risk-taking behavior for STIs; (30) were all negative due to the conservative nature of the society.

CONCLUSION

Sexually transmitted infections (STIs) are a major public health problem, especially in developing countries, viral STIs are on a rise. Being non-curable, prevention and early diagnosis are key tools to prevent their grave consequences, sequelae & complications. Future research and public health preventive efforts are needed especially in women; the main victim of these diseases.

Ethical Clearance- Taken from: Health Committee in Thi-Qar Health Department, Thi-Qar province

Source of Funding- Self

Conflict of Interest - None.

REFERENCES


Factors Associated to Infant Vaccination in Madurese, Indonesia

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1Faculty of Nursing, Airlangga University, Indonesia, 2Health Polytechnic of Surabaya, Indonesia

ABSTRACT

In Madura, a lot of infants have incomplete immunization status in which one of the areas with low immunization coverage is Burneh sub-district. The coverage of complete basic immunization in Burneh only 64% in 2015. The aim of this study was to analyze factors related to vaccination in Madurese, using cross sectional design. The sample were 97 mothers with babies 0-1 years old in Burneh sub-district. Data were collected using questionnaires, then analyzed using Chi square test. The results showed the correlation between knowledge (p = 0.027), confidence (p = 0.000), attitude (p = 0.003), culture (p = 0.000), access to health care (p = 0.013), family support (p = 0.034), and support of health professionals (p = 0.021) with the basic immunization status. Meanwhile, the support of community leaders (p = 0.054) had no correlation with the basic immunization status.

Keywords: Culture, Family support, Immunization, Knowledge, Madurese, Confidence, Attitude, Access to health care

INTRODUCTION

Immunization is an induction of immunity in infants and children to protect them from various diseases so that they grow up healthy(1). In Madura, many infants did not receive complete basic immunization which was proved by the high cases of diphtheria in Bangkalan, Madura. According to the Regent of Bangkalan, there are three villages in sub-districts of Blega, Tanah Merah and Burneh defined as areas with extraordinary occurrence of diphtheria(2). Head of Public Health Office of Bangkalan explained that according to data compiled by Madura Terkini, the infant mortality rate has risen in 2015 as many as 154 cases. This number is greater than in 2014 with 112 cases(2).

According to preliminary study conducted by researchers on March 2016 at the Public Health Office of Bangkalan, the total infant in the Public Health Center (PHC) of Burneh region was 980, while the number of infants who have received complete basic immunization only 627. So there is only 64% infants in Burneh who were completely immunized.

Basic immunization rate in Burneh district from 2012 to 2015 has been uncertainly up and down. In 2012, the coverage of basic immunization was 60.8%. This rate declined into 58.4% in 2013. However, in 2014, the coverage increased to 68.2% which then recurrently declined to 64% in 2015.

Madura is well-known as a society which strictly upholds the cultural norms. Madurese people still believe in the statement or doctrine of the ancestors from antiquity. The people also believe in assumption that the healthy children without any disease should not be brought to health care service to get injection or other treatments. Local health professionals has been actually conducting basic counseling about immunization to mothers who have babies in Burneh district, but somehow the the immunization coverage is still below the target of 100%. Many factors affect the low coverage of immunization in infants. Based on the theory of Green (1991), the behavior of an individual as well as society is affected by three factors: predisposing factor, enabling factor, and reinforcing factor(3).
Based on the problems above, the authors were interested to analyze factors related to basic immunization status of infants in Madurese people.

**MATERIALS AND METHOD**

The population of this cross sectional were mothers with infants aged 0-1 year old in Burneh. Sample size were 97 people selected using cluster sampling. The study was conducted on July 2016. The independent variables were knowledge, beliefs, attitudes, values and norms (culture), access to health services, family support, health professionals support, and community leaders support, while dependent variable was basic immunization status. Data collected using questionnaire, then the categorical data were presented in the form of frequency table and analyzed using Chi square test.

**FINDINGS**

Table 1 provides a summary of the results of the correlation analysis between knowledge, beliefs, attitudes, values and norms (culture), access to health services, family support, health professionals support, and community leaders support with basic immunization status.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>p-value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.027</td>
<td>Significant</td>
</tr>
<tr>
<td>Belief</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.003</td>
<td>Significant</td>
</tr>
<tr>
<td>Culture</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Access to health service</td>
<td>0.013</td>
<td>Significant</td>
</tr>
<tr>
<td>Family support</td>
<td>0.034</td>
<td>Significant</td>
</tr>
<tr>
<td>Health professionals support</td>
<td>0.021</td>
<td>Significant</td>
</tr>
<tr>
<td>Community leaders support</td>
<td>0.054</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

Based on the results of hypothesis testing (Table 1) it could be interpreted that there were 7 independent variables that correlate with basic immunization status namely knowledge, beliefs, attitudes, culture, access to health services, family support and health professionals support.

**DISCUSSION**

According to Green (1991) the behavior of an individual or society about health is determined by the level of knowledge in which the person have. Higher knowledge of mother about the health of the infant, especially for the provision of basic immunization, will influence the mother to visit the place of immunization service. Based on the results of hypothesis testing (Table 1) it could be interpreted that there were 7 independent variables that correlate with basic immunization status namely knowledge, beliefs, attitudes, culture, access to health services, family support and health professionals support. Furthermore, a person who has fair economic and earnings will likely have a good education and knowledge. However, the study that has been done showed that there are nine women who have a good knowledge about immunization but is not practicing immunization for their infants. According to some respondents, they will understand the benefits of immunization as well, but because of busy work and the obligation of taking care the other children they did not carry their infants to the immunization services.
According to WHO the belief is often obtained from parents or grandparents. A person receives his/her belief based on trust and without evidence\(^7\).

Education level of individual related to the level of understanding and perceptions about health and illness\(^7\). Someone who is highly educated will better understand and believe when their body is not going well and looking for a modern health service immediately to prevent the occurrence of disease, for example, by immunization. In addition, the number of children also will indirectly affect the mother’s belief to immunization. Further, good experience and perceived benefits of immunization from previous child will certainly influence to mother’s belief to basic immunization in which this belief will support the mothers to immunize their infants.

However, number of children and mothers’ job in domestic work make mothers do not have enough time to bring their babies to the immunization service although the views and belief upon support good benefit from basic immunization in infants support the mother to do it. From this study, there were 25 mothers who have unsupportive belief to the immunization but still provide basic immunizations to their infant. According to Ali (2000) in Rini (2009), observation or information obtained from education, may make changes upon behavior which evolve the occurance of new behavior. All activities performed by mothers in implementing basic immunization to their infant are the results of knowledge and information from their education\(^8\).

Attitude is a form of evaluation or feeling reactions. Attitudes towards an object can be in the form of supportive and unsupportive feeling about an object. Positive attitude can be predisposing factor which causes the mother to bring her infant to be immunized\(^3\).

Based on research by Rizani et al (2009) which stated that people’s attitude and behavior is the ability, experience and education\(^5\). Age and education level illustrate the maturity of an individual to behave and respond to the environment that can affect knowledge, attitude and practice especially in health behavior. Mother’s experience with the perceived benefits from previous children also have positive influence to their attitude and will promote mother’s behavior to bring their children to health care service in order to receive basic immunization. Furthermore, Rizani et al (2009) stated that mothers’ occupation, either who work or does not work, also has relationship with their attitude towards immunization\(^5\). Working mothers are likely to be more informed of the disease and the benefits of immunization so they will be likely more motivated to immunize their infants.

However, this study showed that there were some women who had negative attitudes about immunization but has been completed immunization for their infants. According Notoatmodjo (2007), an attitude is not automatically realized in an action (over behavior) because to change attitude into habit needs supporting factor or a condition that make it possible, such as facilities and support of other parties\(^7\).

Culture can be regarded as living habits in a community. Interview results by researchers showed that some societies have supportive culture upon immunization, but in practical, they did not bring their infants to the immunization services. It can be caused by the schedule in which they have to work from morning to afternoon and can not bring their infants to PHC. In some cases, the parents tended to spend their money for other daily needs rather than accomodation for immunization.

According to Lawrence Green, the reason for not carrying their children to be immunized is the lack of information about the benefits of immunization or the distance between home and immunization center which is too far\(^3\).

This results correspond with the research of Widiastuti et al (2008) which stated that there was a significant relationship between access to health care services and the basic immunization in infants. The relationship between both variables is also influenced by occupation, income, and number of children\(^9\). Risnawati (2012) stated that access to health care services for getting immunization is not depend on the family income, because the immunization coverage has been covered by the government both for its budget and the accessible service by the immunization service center\(^10\).

This study found several mothers who have access to health care service with incomplete immunization status in their infants. This phenomenon is exist because these mothers have less education and information about immunization.

According to Feiring and Lewis (1984) in Yasin
(2014), good family support is influenced by several demographic factors including: maturity in relation with mothers’ age, mothers’ education level and occupation. The knowledge about basic immunization benefits will increase along with the maturity in which the mothers can explain to the family about those benefits so that their support for immunization will be better. The mothers who have higher education are more aware about the importance of completing basic immunization, so that they will obtain support to carry their infants to the health care service. However, the results of this study showed that there were nine mothers who receive good support from their families but the status of basic immunization were incomplete. It was caused by the mother’s myriad work and responsibility to care other family members as well as children so that they can not bring their infants to health care service regardless the support.

Based on the theory of Green, the health behavior can also be determined by the availability of facilities, attitudes and behavior of health professionals which will support and strengthen the behavior development.

According to the most respondents, support, friendliness, and information obtained from local health professionals are very valuable and have positive impact for them. In several times, health professional along with health caders visited homes for medical examination, particularly the administration of basic immunization in infants and children. So that the mothers who work or who are busy taking care of her family will be stay informed about basic immunizations and can immunize her infant during visitation of the health professional. Although the support of health professional has been sufficient in PHC of Burneh, but there were several mothers who still refused to immunize their infant due to their low education about immunization as well as their business and occupation which makes the mothers did not have any time to provide immunization for their infants.

According Notoatmodjo (2010), Indonesian people is a paternalistic society which usually refers to the behavior of leaders, both formal and informal. The leader is a person who has influence, be honored, and well respected in the society such as public figure and religious leader in which their existence will influence the society. Mostly people actually understand about the benefits of immunization, then the facility is also provided such as PHC and health care service for immunization, but they still hesitate to give immunization to their children because the leaders or public figure also does not join the immunization program for their children.

Based on Green (1991), community and religious leaders become reinforcing factor for the behavior development of an individual or a community. Therefore, the community and religious leaders have crucial role in providing support to people’s view and healthy behavior for the surrounding community.

**CONCLUSION**

Based on the results, it can be concluded that knowledge, beliefs, attitudes, culture, access to health services, family support and health professional support were related factors with basic immunization status in infants.

**ADDITIONAL INFORMATION**

There is no Conflict of Interest related to this research.

All Funds of this research taken from researchers.

This study already has Ethical Approval.

**REFERENCES**


5. Rizani. The relationship between Knowledge, Attitude and Behavior of Mother in Giving Hepatitis B Immunization (0-7 Days) in Banjarmasin City (Hubungan Pengetahuan, Sikap dan Perilaku Ibu


Assessment Potential of Families Increasing ability to Care for Schizophrenia Post Restrain at East Java, Indonesia

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ABSTRACT

After the life of the schizophrenia, post-Restrain is a person who has been free from restraining, but the burden on the client family schizophrenia post-Restrain has not been said to end the role in family factors and local cultural values.

The Aim of this research is to Assessment Potential of Families increasing ability to care for schizophrenia post-restraint. This study was an observational study with cross-sectional approach. Exogenous variables are the cultural value and the potential of the family, the endogenous variable is the ability to care for schizophrenia post-restraint. The population was 157 families, the study sample using cluster sampling method, using a questionnaire study. The analysis used is descriptive analysis and structural testing of the model with Structural Equation Model AMOS.

The result of this study Potential families increased the ability to care for schizophrenia post-restraint, family and cultural values do not increase the family’s ability to care for schizophrenia post-restraint directly but must go through a potential family. The influence of a strong family culture values indirectly affects the family’s ability to care for schizophrenia post restraint. Cultural values and the potential for family care for schizophrenia post-restrain families increased. Cultural values can increase the potential of the family thus increasing the family’s ability to care for schizophrenia post restraint.

Keywords: Potential Family, Caring, schizophrenia, restrain, SEM

INTRODUCTION

The family is the basic unit of community services and primary caretakers of family members. Families have the experience, especially in determining how the care needed by family members¹. One role of the family has the same properties as a member of the family role that knows the situation of family members. That situation applies to the role of families who have family members with mental illness².

Schizophrenia is a severe mental illness affecting (0.3%-0.7%) of the population worldwide, characterized by three domains of psychopathology, including the negative symptoms (social withdrawal, lack of motivation and emotional reactivity), positive symptoms (hallucinations, delusions) and cognitive deficits (working memory, executive attention function). It is considered a leading cause of disability³,⁴. Based on the results of Health Research (Riskesdas) Ministry of Health in 2013, the prevalence of the mental-emotional disorder is indicated by symptoms of depression and anxiety for ages 15 and overreached around 14 million people, or (6%) of Indonesia’s population⁵. While the prevalence of severe mental disorders, such as Schizophrenia about 400,000 people, or about 1.7 per 1,000 population. While in East Java, as many as 728 people with schizophrenia post-restraint⁶.

The family cares about the development of post restrain schizophrenia, but most of them choose to
not respond to the condition of psychiatric patients. Significantly indicated resources to that experiential avoidance mediated the relationship between each of the four Recognized patterns of gender role conflict.

The stigma of mental illness is a multi-faceted phenomenon requiring an understanding from the perspectives of the general public, healthcare providers, persons with mental illness, and their family members. This phenomenon may assume various forms, from the limitations in interpersonal relations, through narrowing Reviews These relations to only some circumstances While the role of informal family, among others, as the originator, negotiator, barriers, ruler, crooks, followers, admission seekers, family caregivers, pioneer family, bullies, coordinator of the family, and the audience. The intent was to help clinicians and Researchers identify individuals Suffering from the disorder and Facilitate assessments of severity, comorbidity, and prognosis as well as treatment options. Cultural value and potential of family members in the family take to care of patients.

**MATERIAL AND METHOD**

The study design was observational with cross-sectional use. Cluster sampling was used to recruit participants from six districts in East Java. The study conducted by taking a relatively short specific time and place. The participants included 157 families with a family member who has a mental illness in East Java. The inclusion criteria were the decision-makers, Age 17 years, caring for the mentally ill, the family Treaty. The analysis used is descriptive analysis and structural testing of the model with Structural Equation Model (SEM) AMOS.

**FINDINGS**

Tabel 1 shows Participant characteristics,

**Tabel 1 The Characteristic Of Family Caregivers N (157)**

<table>
<thead>
<tr>
<th>Characteristic Of Family Caregivers N (157)</th>
<th>N = %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45 (29)</td>
</tr>
<tr>
<td>Female</td>
<td>112 (71)</td>
</tr>
<tr>
<td>Age (M)</td>
<td></td>
</tr>
<tr>
<td>Caregivers</td>
<td>27,40 years</td>
</tr>
<tr>
<td>Living in one house</td>
<td>27,43 years</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Divorced/never married/widowed</td>
<td>67 (43)</td>
</tr>
<tr>
<td>Married</td>
<td>90 (57)</td>
</tr>
<tr>
<td>Duration of illness (M)</td>
<td>3,4 years</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
</tr>
<tr>
<td>Full time/part time</td>
<td>109 (69)</td>
</tr>
<tr>
<td>Unemployed/retired/student</td>
<td>48 (31)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>45 (29)</td>
</tr>
<tr>
<td>Primary</td>
<td>84 (54)</td>
</tr>
<tr>
<td>Secondary</td>
<td>4 (3)</td>
</tr>
<tr>
<td>High school diploma</td>
<td>22 (14)</td>
</tr>
<tr>
<td>College</td>
<td>2 (1)</td>
</tr>
</tbody>
</table>
The results showed the cultural values affect the role of the family, the role of the family affects the ability to care for and the potential effect on the ability of families to take care of the results of the analysis with the software for. The Structural Equation Model (SEM) AMOS can be seen in (Table 2). Based on the results in Table 2 note that the exogenous variables affect significantly to endogenous variables, except cultural variables with variable ability to treat significant. indicators of potential family, coping strategies and indicators of treatment the ability to utilize health services are not good enough to build an endogenous variable. Table 2 illustrates that cultural values affect the ability to maintain direct stronger than cultural values affect the ability to take...
care of automatically mean that the cultural value through the potential for more family greatly affect the ability of the family in care of. cultural values affect the ability to maintain direct stronger than cultural values affect the ability to take care of automatically mean that the cultural value through the potential for more family greatly affect the family’s ability to care for

DISCUSSION

Cultural values Reviews These are of immediate relevance for the regulation of the behavior of individuals in their direct community environment. The research proves that the empowerment of families has a significant impact on family coping to help people, especially schizophrenia, post-restraint. Family empowerment can be used to solve the psychological problems of the family. the socio-cultural family is an open system as a means to meet the needs of caring for 18,19.

Indicator stigma can also be explained by cultural values. Reviews. Families who have family members with schizophrenia post restrain embarrassed by the bizarre condition. It is also consistent with research, post restrain schizophrenia are often treated inappropriately by the family and society. Stereotype endorsement, discrimination experiences and social withdrawal differentially Also related to symptoms and social functioning 20, 21, 22.

Cultural values encourage the formation of family potential as a form of internal factors are derived from the family itself. Family caregivers of care recipients with chronic illnesses. Understanding what African American women who are family caregivers value are important, and giving them an opportunity to judge Reviews their Quality of Life may be empowering 25, 33.

Cultural values of good family could not be sure will make the ability to care for patients post withstand life for the better. Family culture values will affect the ability to care for psychiatric patients post-hold in East Java if through a potential family. Cultural values that can increase the potential of the family thus increasing the post-treatment restrain psychiatric patients.

CONCLUSIONS

In Summary, Cultural Values that can either create a potential family for the better. Cultural values necessary to increase the potential of the family. Tolerance among family members and volunteers have a significant influence in shaping the stigma in the family, family structure, family functioning, family coping strategies. Potential directly affect the family’s ability to care for psychiatric patients post-holding. So that the potential of the family becomes a major factor in improving the ability to care for psychiatric patients post-hold in knowing the problems, decision-making, treating clients sick, modifications to the environment but to the utilization of health service indicator is not significant in shaping the ability to improve care for schizophrenia post restraint, Cultural values of good family could not be sure will make the ability to care for patients post withstand life for the better. Family culture values will affect the ability to care for psychiatric patients post-hold in East Java if through a potential family. Cultural values that can increase the potential of the family thus increasing the post-treatment restrain psychiatric patients.

Conflict of Interest: The Author (s) declare that they have no conflict of interest

Source of Funding: Others source,

Ethical Clearance: This study was approved by the institutional review board of Menur Mental hospital Surabaya (No.423.4/4149/305/2016). The research received a certificate from the hospital ethical permission.
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Role of Vitamin C as Antioxidant in Psoriasis Patients Treated with NB-UVB Phototherapy

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ABSTRACT

Background: Psoriasis is a chronic inflammatory skin disease that has been associated with abnormal plasma lipid metabolism and oxidative stress.

Objective: To assess the anti-oxidative effect of vitamin C supplementation in psoriasis patients treated by NB-UVB phototherapy and its correlation with the disease severity.

Method: A single blind randomized clinical trial included 74 patients with clinically diagnosed psoriasis, conducted at AL-Sadr Medical city and department of Laser research in AL-Najaf City during a period one year. The patients were assigned randomly in to two groups be treated with NB-UVB only or NB-UVB+V. C supplementation of (500mg) twice daily for 12 week and followed up to assess their responses.

Result: Vitamin C and GSH were significantly increased while serum level of MDA significantly reduced, (p<0.05) in NB-UVB+V. C compared to NB-UVB only group. A significant decrease in GSH and increase in MDA (p<0.05). A statistically significant correlation (positive) was found between V. C and GSH and negative correlation was found between V. C and MDA levels after treatment(P<0.05) in NB-UVB+V.C group. PASI score was insignificantly correlated with V. C, GSH and MDA, (P>0.05).

Conclusion: Vitamin C supplementation has a significant role as a safe anti-oxidant in psoriatic patients treated by NB-UVB phototherapy.

Keywords: Psoriasis, Vitamin C, GSH, MDA, Oxidative stress.

INTRODUCTION

Psoriasis is a well-known skin disease affecting 1 to 3% of the population¹. Psoriasis is characterized by well demarcated, erythematous scaly silvery plaques. It is simply distinguished, but unusual forms are not easy to identify². Keratinization disorder, inflammation and exaggerated abnormal disordered epidermal cell proliferation play the main role in the pathogenesis of psoriasis, however, previous studies have connected the oxidative stress and pathogenesis of psoriasis at different levels³. Some researches documented increased levels of oxidative stress markers, decreased levels of antioxidants and the activity of the main antioxidant enzymes in patients with psoriasis ⁴,⁵. The use of antioxidants can protect the epidermis from epidermal toxicity, the antioxidant roles of vitamin C (VC) have been documented, as it has many roles in cellular metabolism, aids in oxidation reduction reactions and acts as an enzyme cofactor. Therefore, vitamin C can be adjunct in the treatment of psoriasis, where some studies indicated that increasing intake of VC may help in prevention or reduction the disturbance between oxidative stress and antioxidant defense in psoriasis ⁶,⁷. Hence the current study is the first study to assess the effect of VC supplementation as an antioxidant.
in management of psoriasis in addition to traditional treatment with NB-UVB in group of Iraqi patients.

Patients and methods:

A total 74 patients of both gender were included in this study. All patients were randomly selected from AL-Sadr Medical city, department of Laser research in AL-Najaf City during the period from January/2017 to January/2018, after the agreement of ethical committee in the medical college of Kufa University. Patients were assigned randomly into two groups, the first group included 38 patients and second group included 36 patients who received NB-UVB without and with V.C (500) mg twice a day for 12 weeks, respectively.

Inclusion criteria:

Patients with optimum nutrient intake with clinically proved to have chronic moderate to severe psoriasis, aged ≥ 20 years, of both genders were included with no co morbid illness or any medications.

Exclusion criteria:

Patient was excluded from the study if he/she had one or more of the following criteria: Currently on other modality of treatment, history of chronic systemic diseases, Obese, (BMI ≥ 30 kg/m²), Smoker and patients with other skin diseases. Detailed history and physical examination were done for participants. (PASI) score were assessed and 5ml of blood samples were collected from each patient before and after treatment and the serum levels of V.C, GSH and MDA were investigated using (ELISA) kits.

The statistical analysis was performed using the statistical package for social sciences (SPSS) version 25, appropriate statistical tests and procedures applied accordingly.

FINDINGS

Patients were almost matched regarding their baseline characteristics; age, gender, family history, and duration of their disease before start treatment. The changes in the studied parameters including V.C, Glutathione (GSH), Malondialdehyde (MDA) and Psoriasis Area and Severity Index (PASI) are shown in (Table 1):

Serum Vitamin C levels of studied groups

There was a significant increase in serum Vitamin C level after treatment in NB-UVB +V.C group as compared to its baseline level (P<0.001). While in NB-UVB only group there was an insignificant decrease in serum V.C levels as compared to its baseline level(P>0.05). On the other hand, the mean level of serum vitamin in C NB-UVB +V.C group after treatment was significantly higher than that of NB-UVB only group, (P<0.001) and the effect size was large, (1.29).

Glutathione levels of studied groups

There was a significant increase in serum GSH level after treatment in (NB-UVB + V.C group) than its baseline level (P<0.001). While in NB-UVB only group) there was a significant decrease, (P<0.001), that lead to a significant difference between the studied groups in GSH levels after treatment (P<0.001), with a large effect size of (1.94).

Malondialdehyde (MDA) levels of studied groups

A significant decrease in serum MDA level after treatment in NB-UVB +V.C group than its level before treatment(P<0.05), While in NB-UVB only group there was a significant increase in serum MDA level, (P<0.05), with a significant difference and a moderate effect size of (0.68),between the studied groups in MDA levels after treatment (P<0.05)

Psoriasis Area and Severity Index (PASI)

A significant reduction in PASI score after treatment as compared to its value mean before treatment in both groups (P<0.001).While the difference between both groups in PASI score after treatment was statistically insignificant (P>0.05) and the effect size was small (0.30).
Table 1. Changes and comparison of V.C, GSH, MDA and PASI score of the studied group before and after treatment

<table>
<thead>
<tr>
<th>Mean</th>
<th>Serum Vitamin C</th>
<th>Serum GSH</th>
<th>Serum MDA</th>
<th>PASI score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NB-UVB only (n = 38)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>nB-uVB only (n = 36)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Effect size</td>
<td>P. value between groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Serum Vitamin C</td>
<td>Before treatment</td>
<td>2449.37 1084.3</td>
<td>2112.78 834.16</td>
<td>1.29</td>
</tr>
<tr>
<td>After treatment</td>
<td>1907.98 1242.04</td>
<td>3233.36 808.27</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>P. value within group</td>
<td>0.161</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum GSH</td>
<td>Before treatment</td>
<td>68.90 25.56</td>
<td>61.47 32.77</td>
<td>0.29</td>
</tr>
<tr>
<td>After treatment</td>
<td>48.03 25.86</td>
<td>97.03 26.04</td>
<td>1.94</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>P. value within group</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum MDA</td>
<td>Before treatment</td>
<td>336.48 241.63</td>
<td>442.73 395.54</td>
<td>0.68</td>
</tr>
<tr>
<td>After treatment</td>
<td>394.35 298.18</td>
<td>237.73 148.51</td>
<td>0.001</td>
<td>0.005</td>
</tr>
<tr>
<td>P. value within group</td>
<td>0.001</td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASI score</td>
<td>Before treatment</td>
<td>19.61 6.75</td>
<td>20.54 7.02</td>
<td>-</td>
</tr>
<tr>
<td>After treatment</td>
<td>11.12 6.07</td>
<td>9.15 6.92</td>
<td>0.3</td>
<td>0.21</td>
</tr>
<tr>
<td>P. value within group</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlation between the changes in vitamin C, GSH, MDA ,PASI score and the demographic variables of the studied groups

As shown in table.2 , the bivariate Pearson’s and Spearman’s correlation tests were applied in each group to assess the correlation between the changes in each of vitamin C, GSH, MDA ,PASI score from one side and the demographic variables from the other side, the bivariate correlations were statistically insignificant for all of the 4 parameters, in both studied groups, in all correlations, (P>0.05), (Tables 2 and 3)

Table 2. Correlation between demographic variables and changes in V.C, GSH, MDA and PASI score of patients in NB-UVB only group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation measure</th>
<th>Age</th>
<th>Duration</th>
<th>Gender</th>
<th>Family history</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>R</td>
<td>0.40</td>
<td>0.26</td>
<td>-0.04</td>
<td>-0.39</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.10</td>
<td>0.29</td>
<td>0.87</td>
<td>0.11</td>
</tr>
<tr>
<td>GSH</td>
<td>R</td>
<td>0.01</td>
<td>0.06</td>
<td>0.37</td>
<td>-0.32</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.97</td>
<td>0.81</td>
<td>0.13</td>
<td>0.20</td>
</tr>
<tr>
<td>MDA</td>
<td>R</td>
<td>-0.30</td>
<td>-0.01</td>
<td>0.42</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.23</td>
<td>0.97</td>
<td>0.08</td>
<td>0.43</td>
</tr>
<tr>
<td>PASI score</td>
<td>R</td>
<td>0.04</td>
<td>0.26</td>
<td>-0.34</td>
<td>-0.35</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.88</td>
<td>0.30</td>
<td>0.17</td>
<td>0.16</td>
</tr>
</tbody>
</table>

R : Correlation coefficient
Table 3. Correlation between demographic variables and changes in V.C, GSH, MDA and PASI score of patients in NB-UVB+V.C group.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation measure</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Age</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>R</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.28</td>
</tr>
<tr>
<td>GSH</td>
<td>R</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.79</td>
</tr>
<tr>
<td>MDA</td>
<td>R</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.50</td>
</tr>
<tr>
<td>PASI score</td>
<td>R</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.59</td>
</tr>
</tbody>
</table>

R: Correlation coefficient

Inter-correlation between V.C, GSH, MDA and PASI Score after treatment in NB-UVB+V.C group.

A statistically significant positive correlation had been found between the vitamin C and GSH level P = 0.001, a significant inverse correlation between VITAMIN C and MDA P = 0.001. There was a weak insignificant inverse correlation between GSH and MDA (P>0.05). PASI was insignificantly correlated with VC, MDA and GSH, (P>0.05), (Table 4).

Table 4. Correlation between Vitamin C, GSH, MDA and PASI score after treatment of patients in NB-UVB+V.C.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation measure</th>
<th>Vitamin C</th>
<th>GSH</th>
<th>MDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSH</td>
<td>R</td>
<td>0.608</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDA</td>
<td>R</td>
<td>-0.655</td>
<td>-0.059</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.001</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>PASI score</td>
<td>R</td>
<td>-0.103</td>
<td>-0.064</td>
<td>0.392</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.623</td>
<td>0.761</td>
<td>0.052</td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study there was a significant increase in serum V.C levels in (NB-UVB +V.C) group because of V.C supplementation and a non-significant decrease in V.C levels in NB-UVB only group this is because of it is the major water-soluble antioxidant found in extracellular and intracellular compartments, so it is important factor in skin and because of its high level than other anti-oxidants and the concentrations are elevated in epidermis than dermis, this may give it reluctance to UVB irradiation unlike other anti-oxidants that can affected by UVB irradiation 8. In the present study we found a weak negative insignificant correlation between V.C and PASI score, unlike a study done by Tampa et al.,9 who revealed a significant negative relationship between vitamin C and PASI score in patients with active disease. V.C has important role in development of psoriasis, some studies showed that psoriasis associated with low vitamin C concentrations because of the generation
ROS in psoriasis\textsuperscript{9,10}. There are no information to support current results on the effect of V.C in psoriasis patients.

Regarding serum GSH The results of these study are supported with a study done by Waly et al.,\textsuperscript{(6)} thiols, and total antioxidant capacity, (TAC who reported that adequate dietary intake enriches with V.C lead to increase in the plasma GSH levels in which there is positive correlation between them. Lenton and his co-workers \textsuperscript{11} after 13 wk of vitamin C supplements (500 or 1000 mg/d) reported that V.C supplementation was highly effective in increasing GSH level in blood plasma and WBC. Our study demonstrated that there is direct correlation between V.C and GSH as supplementation of V.C is an indirect way to increase serum GSH levels because of V.C acts as a co-factor for (GSH enzymes) that required for GSH functions to maintain them in active state\textsuperscript{12}. Unlike in NB-UVB only group in which GSH level was significantly decrease, this is because of the ability of GSH to directly get rid of free radicals and to act as a co-substrate to the glutathione peroxidase GSH-Px enzyme that catalyzed reduction of oxidative stress, makes GSH to have important role in defense mechanisms against oxidative stress \textsuperscript{13}. So this decreases might be attributed to breakdown in scavenger process due to UVB enhance free radical formation\textsuperscript{14} and probably due to disease activity itself as it is considered oxidative stress condition that consume GSH in psoriatic patients\textsuperscript{15}. Also our finding suggested insignificant correlation between GSH and PASI score, this in concordance with a previous study that found no correlation between PASI score and GSH levels\textsuperscript{16}.

Regarding serum MDA: The results of this study are in agreement with a previous studies that found vitamin C supplementation significantly reduced MDA values in case of oxidative stress conditions\textsuperscript{17,6}. Other studies showed a significant inverse relation between malodialdehyde and vitamin C levels and documented that lack in vitamin C could result in inadequate defense against free radicals which lead to more peroxidation in lipids\textsuperscript{18,6}. In the present study the reduction in the level of MDA during supplementation with vitamin C due to role of ascorbate as a one of the most important plasma antioxidant, it plays an essential role in keeping plasma lipids from oxidative damage induced via free radicals\textsuperscript{19}, similar concept also adopted in an earlier study was conducted by Pujari et al.,\textsuperscript{5} who suggested that intake of V.C could reduce the risk of psoriasis. In the current study there was insignificant weak negative correlation between MDA and GSH that disagree to a study done by Jaswal et al.,\textsuperscript{20}. Furthermore our results revealed that MDA level was insignificantly related to PASI score in (NB-UVB +V.C )group this in agreement to a previous study done by Abdel-Mawla et al.,\textsuperscript{(21)} and disagree to a study done by Attwa and Swelam\textsuperscript{22}, while in NB-UVB only group in which MDA levels was significantly increase might be due to the effect of UVB irradiation because it is capable of inducing lipid peroxidation and impairment of anti-oxidant defense system\textsuperscript{23}.

**Conflict of Interest:** None

**Source of Funding:** Self-funded

**Ethical Clearance:** The study protocol approved by the Council of the Collage of Medicine University of Kufa and the department of physiology. All the official agreement were obtained from the Health directorate and the Ethical committee of Najaf Health directorate, Training and Researches Center. Informed consent signed obtained from each individual patient before enrollment and all were informed about the nature and the main objective of the study, Participants’ data were kept confidentially and used merely for the purpose of the study, and patients data were collected in accordance with the Helsinki declaration.

**REFERENCES**


Analysis of the Stressor and Coping Strategies of Adolescents with Dysmenorrhoea

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1Professor, 2Bachelor Degree Student, 3Lecturer, Faculty of Nursing, Universitas Airlangga, Surabaya

ABSTRACT

Introduction: Every woman has a different menstrual experience. However, many encounter menstruation alongside disorders that cause discomfort, such as pain felt during menstruation called dysmenorrhoea. One of the factors that influence the occurrence of primary menstrual pain is the psychological factor of stress.

Objective: This study aimed to identify the strategies used to overcome dysmenorrhoea in young women.

Method: This study used a cross-sectional design and a simple random sampling technique. The calculation result involved 132 samples. The independent variables were personal stressors, environmental stressors, and coping strategies. The dependent variable was dysmenorrhoea. The data was collected using a questionnaire that was tested for validity and reliability. The analysis used a multiple linear regression test with a significance level α≤0.05.

Results: The results showed that the personal stressors related to the age aspect were associated with dysmenorrhoea (p=0.002), and that the age of menarche was associated with dysmenorrhoea (p=0.023). Environmental stressors within the aspect of workload had a correlation with dysmenorrhoea (p=0.009), and interpersonal relationships had a correlation with dysmenorrhoea (p=0.015). Coping strategies, particularly emotionally-focused coping also had a relationship with dysmenorrhoea (p=0.019).

Conclusion: Biological age and age of menarche are two of the causes of personal stress for young women. Academic stress is also one of the highest causes of stress in adolescent girls. The demands of academic achievements, interactions with peers, bad teachers and pressuring parents can result in adolescents experiencing stress, resulting in the physical health effect of dysmenorrhoea during menstruation. If adolescents cannot find a good method coping, the risk of dysmenorrhoea will be higher.

Keyword: adolescent, dysmenorrhoea, stressor, strategy coping.

INTRODUCTION

Menstruation is a period of blood flowing from the uterus through the cervix and discharging through the vagina. A menstruation cycle begins on the first day of menstruation and continues for, on average, 8 days. Normally, it is estimated to be around 21 to 35 days1. Menstrual disorders can occur at different ages. This particular disorder occurs more often in early puberty2 according to the survey result that many students still didn’t know how to decrease dismenore. This research used pre experiment method with the one group pretest-posttest design. The research population was all of the XI class student at Kediri High School 5 whom got dismenore at April 2016. The sample was 16 respondent which taken by accidental sampling. Primary data which is got from dismenore pain measurement at teenager which is done before giving the dark chocolate (pre test. Every woman has a different menstrual experience; many encounter menstruation accompanied with disorders causing discomfort such as pain felt during menstruation in the form of dysmenorrhoea3. Dysmenorrhoea is one of the most common
gynaecological disorders, characterised by pain that is localised in the inferior quadrant of the abdomen and spread through the inner thigh. There are two types of dysmenorrhoea; primary and secondary dysmenorrhoea. Primary dysmenorrhoea usually happens when the individual is younger than 20 years old and there is no correlation with other gynaecological disorders, while secondary dysmenorrhoea happens after the age of 20 years old and correlates with pelvic disease.

The WHO data in 2016 showed that incidence rate was 1.769,425, meaning that 90% of women experience dysmenorrhoea and around 10-15% experience severe dysmenorrhoea. Primary dysmenorrhoea often occurs in more than 50% of women and 15% of them experience severe pain. According to the Indonesian Ministry of Health (2010), primary dysmenorrhoea is experienced by 60-75% of young women. One of the factors which influences primary dysmenorrhoea is stress. The cause of stress in adolescents can originate from the inner or outer self. For example, an abundance of academic demands such as tests and assignments, stress because of the high achievement-related demands from their parents, or from the surrounding environment such as inconvenient classrooms and the school itself.

One of the factors influencing primary menstrual pain is the psychological factor of stress. If adolescents are not able to choose the right coping strategy to deal with the stress that they encounter, the perceived dysmenorrhoea will be stronger. The purpose of this study was to identify the stressor relationships and coping strategies related to dysmenorrhoea in adolescents.

**METHOD**

This study was a descriptive research study that used a cross-sectional design. The sample in this research consisted of 132 female students at Junior High school 29 in Surabaya utilising simple random sampling. The independent variables of the research included personal stressors (people, menarche time, menstrual duration, and menstrual cycle), environmental stressors (workload and interpersonal relationships) and coping strategies. The dependent variable was dysmenorrhoea. The instruments used in the collecting data were a questionnaire for measuring the involved stressors and the ‘Ways Coping Questionnaire’ from Lazarus & Folkman 1984 for their chosen coping strategy. The data analysis used in this research utilised a multiple linear regression test with a significant level of α<0.05.

**RESULTS**

Table 1. Respondent Demographic Characteristics (n=132)

<table>
<thead>
<tr>
<th>Respondents’ Characteristics</th>
<th>Criteria</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>13 Years old</td>
<td>69</td>
<td>52.3</td>
</tr>
<tr>
<td></td>
<td>14 Years old</td>
<td>50</td>
<td>37.9</td>
</tr>
<tr>
<td></td>
<td>15 Years old</td>
<td>13</td>
<td>9.8</td>
</tr>
<tr>
<td>Menstruation Disorders</td>
<td>Pain</td>
<td>132</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>No pain</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Family History</td>
<td>Yes</td>
<td>71</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>61</td>
<td>46.2</td>
</tr>
<tr>
<td>Previously experienced dysmenorrhoea</td>
<td>Yes</td>
<td>95</td>
<td>71.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>37</td>
<td>28.1</td>
</tr>
<tr>
<td>Dysmenorrhoea disorders</td>
<td>Nausea</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Dizzy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Vomit</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Lower stomach pain</td>
<td>132</td>
<td>100</td>
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<tr>
<td>Dysmenorrhoea Treatment</td>
<td>Sleep</td>
<td>87</td>
<td>65.9</td>
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<tr>
<td></td>
<td>Taking medicine</td>
<td>17</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>Listening to Music</td>
<td>28</td>
<td>21.2</td>
</tr>
<tr>
<td>Menarche age</td>
<td>&lt;12 Years old</td>
<td>34</td>
<td>25.8</td>
</tr>
<tr>
<td></td>
<td>12 Years old</td>
<td>62</td>
<td>47.0</td>
</tr>
</tbody>
</table>


**Multiple Linear Regression Test of the Stressors and Coping Strategies in Female Adolescents with Dysmenorrhoea**

Table 2. The Correlation between Stressors and Coping Strategies in Female Adolescents with Dysmenorrhoea at Junior High School 29, in Surabaya in July 2018

<table>
<thead>
<tr>
<th>Sub Variables</th>
<th>Category</th>
<th>F</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>13 Years old</td>
<td>69</td>
<td>52.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14 Years old</td>
<td>50</td>
<td>37.9</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>15 Years old</td>
<td>13</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Menarche age</td>
<td>&lt;12 Years old</td>
<td>34</td>
<td>25.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 Years old</td>
<td>62</td>
<td>47.0</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>&gt;12 Years old</td>
<td>36</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>Sub Variables</td>
<td>Category</td>
<td>F</td>
<td>%</td>
<td>p</td>
</tr>
<tr>
<td>Environmental Stressor</td>
<td>Workload</td>
<td>Low</td>
<td>28</td>
<td>21.2</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td>101</td>
<td>76.5</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Interpersonal Relationship</td>
<td>Low</td>
<td>8</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td>98</td>
<td>74.2</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>26</td>
<td>19.7</td>
<td></td>
</tr>
<tr>
<td>Sub Variables</td>
<td>Category</td>
<td>F</td>
<td>%</td>
<td>p</td>
</tr>
<tr>
<td>Strategy Coping</td>
<td>emotion-focused Coping (EFC)</td>
<td>112</td>
<td></td>
<td>84.8</td>
</tr>
</tbody>
</table>

This study found that stressors and coping strategies had a significant correlation in association with adolescents with dysmenorrhoea. Personal stressors within the aspects of biological age and menarche age had a significant relationship with the occurrence of dysmenorrhoea. As seen in Table 2, the value of menarche age and age was 0.002 and 0.023, which means that p < 0.05. Environmental stressors with the workload aspect and interpersonal relationship aspect had a significant relationship with dysmenorrhoea in adolescents. It also had a p-value of 0.009 and 0.015, which equals p<0.05. Coping strategy within the emotion-focused
coping (EFC) aspect had a significant correlation with incidences of dysmenorrhoea in adolescents with a value of \( p \) emotion-focused coping (EFC) 0.019, equal to \( p<0.05 \).

**DISCUSSION**

**Personal Stressors of Female Adolescents with Dysmenorrhoea**

The age of adolescents is one of the factors of dysmenorrhoea incidence. The older the age of the woman, the more that the incidence of dysmenorrhoea will decrease with reduced uterine nerve function due to aging. The majority of the study respondents were female students aged either 13-14 years old, so the research respondents were classified as early adolescents. Dysmenorrhoea is often experienced in adolescence because in adolescence, the reproductive organs do not quite function properly and are susceptible to stress if coping has not been constructed. Thus, there is a significant relationship between age and dysmenorrhoea. Susanto, et. Al. (2008) research in Makassar city showed that the most common age group suffering from dysmenorrhoea disorder was between 13-15 years old7.

Adolescence is a period in the interval of 10-19 years old. Adolescent age limits are categorised into 3 age groups, namely early adolescents (aged 12-15 years old), middle adolescents (ages 15-18 years old), and late adolescents (18-21 years old). In adolescents aged 13-14 years old, anxiety will increase when hormonal changes occur that cause discomfort. If on the contrary this anxiety is allowed to linger, then the psychological adverse effects of this anxiety results in stress, in turn resulting in physical disorders including dysmenorrhoea1.

Menarche age has a significant correlation to incidences of dysmenorrhoea. This is evidenced by some of the respondents experiencing rapid menstruation at an age younger than 12 years old. Menarche age is one of the factors that causes dysmenorrhoea. Research from Sophia, et al. (2013) stated that there is a correlation between the age of menarche and dysmenorrhoea. Menarche at a younger age has a higher risk of the incidence of primary dysmenorrhoea compared to women with a menarche age that is older than 11 years old8.

Menarche is the first menstruation experienced by female adolescents, which is the sign of sexual maturity, although the reproductive system is not completely developed until 1-1.5 years after menarche. Menarche usually starts at the age of 9-12 years old, and there is a small percentage who experience it later than the age of 13-15 years. Since menarche is initiated, women will continue to experience menstruation throughout their lives, every month until they reach the age of 45-55 years, which is commonly called menopause2 according to the survey result that many students still didn’t know how to decrease dismenore. This research used pre experiment method with the one group pretest-posttest design. The research population was all of the XI class student at Kediri High School 5 whom got dismenore at April 2016. The sample was 16 respondent which taken by accidental sampling. Primary data which is got from dismenore pain measurement at teenager which is done before giving the dark chocolate (pre test. Menarche at a younger age involves a higher risk of dysmenorrhoea compared to women who experience menarche at an age older than 11 years old. Factors such as hereditary health, food, and health as a whole can accelerate or inhibit the incidence of menarche8.

Students who start menstruation at the age of \( \leq \) 12 years old will have a higher risk of experiencing a dysmenorrhoea than students who menstruate at the age of 13-14 years old. The earlier menarche age (\( \leq \) 12 years) is where the reproductive organs have not developed optimally and as there is still a narrowing of the cervix, there will be pain during menstruation. This happens because the woman’s reproduction system is not yet functioning fully.

**Environmental Stressors on Female Adolescents with Dysmenorrhoea**

Having an overloading workload is one of the factors of dysmenorrhoea incidences. This is proven by 5 respondents who considered doing too much schoolwork to be a very burdensome workload. In addition, 105 respondents considered final semester examinations and bad grades during the exams themselves to be a burdensome workload. A total of 37 respondents said they had never experienced dysmenorrhoea before and that in the exam period, they had dysmenorrhoea. A workload considered to be a burden can cause a significant relationship between workload and incidences of dysmenorrhoea.
The academic workload on adolescents is predominantly assignments and tests. Baumel (2000 in Nglai, 2008) stated that stress in relation to academics in children arises when expectations for their academic achievement increases, from parents, teachers and their peers. This stress increases every year, along with the age-related demands of talented and accomplished children, which will never stop. Stress is a physiological, psychological and human behavior response that tries to adapt and regulate both internal and external stressors. One of the effects from stress is experiencing dysmenorrhoea during menstruation. This can be related to a disturbance in endocrine activities, which raises the prostaglandin level.

Diana Sari’s (2015) research on female students in Yogyakarta stated that mild primary dysmenorrhoea is most often experienced by the respondents who experienced mild stress. The respondents who experienced severe dysmenorrhoea were the respondents who experienced severe stress. Katwal PC et al (2016) stated that adolescents with dysmenorrhoea can find that it affects their academic and social performances, and sporting activities conducted from 1st Dec. 2012 to 31st Jan. 2013. The study was conducted in Kathmandu University School of Medical Sciences. A total of 184 participants consented for this study and each one was given a questionnaire to complete. This study included only unmarried nulliparous, healthy (all through first to final years.

Interpersonal relationships were one of the biggest factors related to triggering a stress in adolescents which can cause them to suffer from a biological disorder such as dysmenorrhoea during menstruation. This was proven by 23 respondents who said ‘unable’ in relation to helping others, working together and supporting one another to complete tasks in a group, as well as resolving conflicts with friends within group assignments. A total of 6 people stated “unable” on the matter of communicating well and being polite towards their parents. This inability caused a significant correlation between interpersonal relationships and dysmenorrhoea.

An interpersonal relationship is a relationship that consists of two people or more who are dependent on each other and who use a consistent interaction pattern. In the school environment, female students have high academic demands but at the same time, they must be able to socially interact and establish good relationships with others, such as with other students, between students and other school members in relation to both verbal and nonverbal communication methods. Ernawati (2015) stated that the higher the support received by the students, the lower the stress that the students had, and vice versa; the lower the social support received by the students, the higher the stress of the students11. More family and social support allowed the adolescents have higher self-esteem and a more optimistic perspective. Therefore, it makes the students more capable of dealing with their problems, since social interactions are one of the factors influencing stress in students.

There are some who are unable to interact with their friends because they feel inferior, have internal conflicts and who cannot solve problems with their friends. Some are even unable to communicate well with their parents because their parents are divorced, dead or work outside the city. This is considered by adolescents to be a stressor, and causes adolescents to experience stress which will later cause pain during menstruation caused by endocrine disruption.

Strategy Coping in Female Adolescents with Dysmenorrhoea

Emotion-Focused Coping (EFC) has a significant correlation with dysmenorrhoea. It has been proven that the majority of respondents chose emotion-focused coping as their chosen coping strategy when experiencing dysmenorrhoea. This is supported by Taufik’s (2013) research, which stated that women are more likely to use emotion-focused coping as they tend to regulate their emotions when dealing with sources of stress13.

A coping strategy is a coping method used by individuals when handling the demands of life. A coping strategy consists of two categories, according to Lazarus & Folkman’s theory (1984), namely Problem-Focused Coping and Emotion-Focused Coping. The factors that influence the use of coping strategies include health, problem-solving skills, positive self-esteem, social and economic support.

A coping strategy that focuses on emotion or EFC will be susceptible when encountering dysmenorrhoea during the menstruation. This is because EFC tends to avoid the problem that is being experienced. When individuals avoid problems that make them experience stress, the problems that they face will be greater and so the stress will increases. Young women must choose...
their strategy coping wisely in order to reduce the risk of dysmenorrhoea. When an individual can adapt themselves to the change that they experience due to an obtained stressor, then an individual has the ability to face both positive and negative stimulation.

CONCLUSION

Adolescents with dysmenorrhoea needs structural approach from school and family. Focusing on biological age, menarche age and strengthening coping strategy may be benefits to reduce the severity of dysmenorrhoea.

Ethical Clearance: This study has passed the institutional review board from Faculty of Nursing, Universitas Airlangga, Surabaya number 966-KEPK.

Source of Funding: This study is self-funded research project.

Conflict of Interest: None.

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3. Diana S. Hubungan Stres dengan Kejadian Dismenore Primer pada Mahasiswa Pendidikan Dokter Fakultas Kedokteran Universitas Andalas. [The Relationship of Stress to Primary Dismenorrhhea Events in Medical Education Students of the Faculty of Medicine Andalas University]. J Andalas. 2015;4(2).


Cranial CT Scan and Sonographic Finding in Term and Preterm Newborn

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ABSTRACT

Objective: to assess the CT scan and sonographic findings in term and preterm newborns

Method: A total of 52 neonates who were referred to radiology department and those admitted to neonatal intensive care unit, ultrasound revealed equal number of newborns with normal and abnormal findings, 26 for each, while the brain CT revealed abnormal findings in 31 represented almost (60%) of newborns, the overall agreement between ultrasound and CT was good (percent agreement = 82.7%, Kappa = 0.654), in detection of Asphyxia, the was very good, (percent agreement =90.4%, Kappa = 0.81 ), for intracranial hemorrhage (ICH), moderate in intraventricular hemorrhage (IVH) and good in germinal matrix hemorraghes (GMH). However, the agreement between ultrasound and brain CT in total number of detected lesions among the studied group was good, (percent agreement = 86.5%, kappa was 0.802). Conclusions: Cranial CT scan and ultrasonography are good modalities in detection of brain abnormalities in term and preterm neonates and there was a good agreement between the two modalities brain abnormalities for either the number of lesions, or the specific pathology.

Keywords: Term neonates, preterm neonates, Cranial CT scanning, Cranial ultrasonography, intraventricular hemorrhage, intracranial hemorrhage.

INTRODUCTION

Neonatal intracranial hemorrhagic and hypoxic injury can be isolated as those happening in the preterm and in the term newborn children. In the preterm, the significant sores are germinal lattice discharge (GMH)/intraventricular drain (IVH) and periventricular leuomalacia (PVL)¹,². In the term newborn children the real issues are hypoxic-ischemic encephalopathy/damage (HII) and intracranial hemorrhage³,⁴. Intracranial hemorrhage is unprecedented in term newborn children and when it happens is by and large inconsequential to the germinal matrix⁵. Ultrasonography (USG), processed computed tomography CT) and magnetic resonance image (MRI) are being routinely used to screen the neonate for plausible intracranial problems⁶-⁹. The benefits of USG are that it is effectively accessible, modest, speedy and simple to perform and should be possible at the bedside. Additionally, it doesn’t utilize ionizing radiation. In any case, sonography does not separate subarachnoid from subdural hemorrhages and it is additionally far-fetched that a little cortical discharge will be detected¹⁰. It is moderately heartless to change in cerebrum tissue perfusion and to intense HII¹¹,¹². The benefits of CT incorporate its simple accessibility and high spatial determination. CT gives incredible anatomic determination of the whole cerebrum parenchyma. Likewise, it isn’t administrator subordinate, moderately less expensive and can be all the more quickly executed when contrasted with MRI. CT scan dependably recognize amongst subdural and subarachnoid hemorrhage, which is troublesome on sonography¹⁰. Anyway in untimely babies the part of CT for the documentation of intense hypoxic ischemic brain damage is constrained. High water substance of the untimely brain blocks the utilization of diminished lessening as a record of cerebral edema. CT contributes

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fundamentally to add up to radiation dosage got from therapeutic imaging in kids. Cranial ultrasound (cUS) is a promptly accessible, convenient and by a wide margins the most basic first line system of intracranial imaging in neonates with suspected intracranial discharge. It uses the fontanelles of neonates as a sonographic window to get constant, auxiliary appraisal of the intracranial substance. cUS is especially significant for evaluating the ventricular framework and periventricular white matter, with amazing between onlooker understanding for germinal network discharge GMH) or intraventricular discharge (IVH) and cystic periventricular leukomalacia PVL) 11. cUS has a few critical constraints: its dependence on acoustic windows implies that discharge in the districts of the mind’s convexity, (for example, subdural or subarachnoid discharge) might be missed. cUS additionally has low affectability for distinguishing pathology in the back fossa, in spite of the fact that use of supplemental acoustic windows for example, the mastoid fontanelle, is useful 13,14 . The present study aimed to assess the cranial CT scan and sonographic findings in term and preterm newborns to identify the brain abnormalities that detected in each modality.

METHOD

A prospective clinical study conducted during the period from October 2017 to August 2018, in Al-Hilla maternity and pediatrics Teaching hospital. A total of 52 neonates were prospectively selected in the department of radiology and consecutively entered in the study after obtaining of their caregiver (parents, or relative) consent to participate their neonates in the study. Cranial ultrasonography and CT was performed by specialists radiologist and resident physician in the radiology department (the researcher), with no additional charges to the family. Neonate was excluded from the study if he/she had congenital CNS anomalies and malformation, documented infections or tumors, also when ultrasonography could not performed within 24 hours after CT scanning by the radiologist the neonates excluded. The ultrasonography images were reviewed by the specialist radiologist and the researcher looking for echogenicity, and other signs of abnormalities, and clinical readings were reported. The ultrasonography was performed by or under the direction of the specialist radiologist. The corresponding CT scanning images were evaluated later by the same radiologist. Images were assessed looking for the following abnormalities: germinal matrix hemorrhages (GMH) including IVH and parenchymal extension; non-matrix related hemorrhage, periventricular leukomalacia and other related findings. Data management and analysis were performed using the statistical package for social sciences, version 25 and appropriate statistical tests and procedures were applied accordingly. Kappa statistics were applied and the Cohen’s kappa coefficient (κ) was calculated for the agreement between ultrasound and CT scanning in detection of abnormalities.

FINDINGS

There were, 46 (88.5%) term and 6 (11.5%) pre-term neonates. Male to female ratio was almost 2.5. Age ranged (1 – 8) days (Table 1).

Figure 2 shows the distribution of the studied group according to the sonographic echogenisity; normal echogenisity was reported in 30 neonates (57.7%), hyperechoic in 18 (34.6%) and hypoechoic in only 4 (7.7%).

Overall Agreement between ultrasound and brain CT was good in detection of abnormal findings (kappa = 0.654), agreement was very good (kappa = 0.81) in detection of Asphyxia, good in detection of ICH (kappa = 0.624), moderate in IVH (kappa = 0.562) and good agreement in detection of GMH, (kappa = 0.689), Agreement was very good for the detection of total number of brain abnormalities, (kappa was 0.802).

| Table 1. Age and gender distribution of the studied group (N = 52) |
|-----------------|-----------------|------------|
| Gender | No. | % |
| Male | 37 | 71.2 |
| Female | 15 | 28.8 |
| Age (day) | | |
| One | 8 | 15.4 |
| Two | 15 | 28.8 |
| Three | 7 | 13.5 |
| Four | 6 | 11.5 |
| Five | 8 | 15.4 |
| More than five | 8 | 15.4 |
| mean ± SD | 3.44 ± 2.01 | - |
| range | 1 – 8 | - |

SD: standard deviation
Table 2. Agreement between ultrasound and brain CT in detection of overall normal and abnormal findings of the studied group (N = 52)

<table>
<thead>
<tr>
<th>Finding</th>
<th>Brain CT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>Normal</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>31</td>
</tr>
</tbody>
</table>

Percent agreement 82.7%, Kappa = 0.654 (good agreement)

Table 3. Agreement between ultrasound and brain CT in detection of abnormal brain findings

<table>
<thead>
<tr>
<th>Detected pathology</th>
<th>Percent agreement</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphyxia</td>
<td>90.4%</td>
<td>0.81 (very good)</td>
</tr>
<tr>
<td>ICH</td>
<td>80.8%</td>
<td>0.624 (good)</td>
</tr>
<tr>
<td>IVH</td>
<td>78.8%</td>
<td>0.562 (moderate)</td>
</tr>
<tr>
<td>GMH</td>
<td>84.6%</td>
<td>0.689 (good)</td>
</tr>
<tr>
<td>Overall total number of lesions</td>
<td>86.5%</td>
<td>0.802 (very good)</td>
</tr>
</tbody>
</table>

**DISCUSSION AND CONCLUSION**

The present study assessed the CT scan and sonographic findings in 52 term and preterm newborns who were recruited from those referred to radiology department and those admitted to neonatal intensive care unit, the majority, (88.5%), of the studied newborns were term neonates and only 11.5% were preterm, this findings consistent with the epidemiological characteristics of the incidence of preterm births; according to the World Health Organization (WHO) reports, In the present study, generally, Ultrasound revealed equal number of newborns with normal and abnormal findings, 26 for each, while the brain CT revealed abnormal findings in 31 newborns represented almost 60% of newborns,
despite the CT detected more abnormal findings, the agreement between ultrasound and CT was good (percent agreement = 82.7%, Kappa = 0.654). In detection of specific pathologies, the agreement between ultrasound and brain CT varied in different pathologies, in detection of Asphyxia, the agreement between ultrasound and brain CT was very good, (percent agreement =90.4%, Kappa = 0.81 ), for ICH agreement was good (percent agreement = 80.8%, kappa = 0.624), in detection of IVH, ultrasound and brain CT moderately agreed (percent agreement =78.8% , kappa = 0.562). Good agreement was found between ultrasound and brain CT in detection of GMH (percent agreement = 84.6% , kappa = 0.689). However, the agreement between ultrasound and brain CT in total number of detected lesions among the studied group was good, (percent agreement = 86.5%, kappa was 0.802), these findings indicated that ultrasound is a good investigation in suspected neonatal cases of brain lesions. Recently, Bano et al. 15 documented that cranial ultrasound had a crucial role in detection of PVL and intracranial hemorrhage with good sensitivity and specificity compared to CT. From other point of view, CT is less sensitive and specific than MRI . However, in very sick neonates, CT could be used without need for sedation, but the exposure to radiation may limit this advantage, on the other hand, cranial ultrasound, has some limitations in comparison to CT; as it is lower sensitive for detection of cortical lesions, operator dependent and has some inter-observer variability, nonetheless, cranial ultrasonography, is a non-invasive, relatively low cost and can performed at bed-side, this is very important advantage in unstable or very premature neonates, as well as, it is suitable for screening and follow-up examination16–18.

Findings of the present study also consistent with previous studies conducted in the last years; Blankenberg et al. 16 in their comparative study in 2012 concluded no significant difference in either the number of findings observed or interobserver agreement between sonography and CT in diagnosis of PVL, additionally, higher kappa value and agreement had been found in earlier study done by Pinto-Martin et al. in 2004 19.

On the other hand, recently, Girard et al. (2018) documented that ultrasound had good agreement with CT and still the primary method of imaging to assess brain lesions particularly in preterm newborns 20.

In contrary, an earlier previous retrospective study included 72 newborns, found that CT and MRI imaging had significant advantage over ultrasound, for the detection of intracranial ischemia and hemorrhage 21. In another study was conducted in 2010 in India, Khan et al.22 concluded that ultrasound is better modality for imaging preterm neonates with suspected IVH or PVL but is unreliable in the imaging of term newborns with suspected ICH.

The discrepancy in the findings of different studies could be attributed to the differences in the study design nature, time elapsed to perform ultrasound and the sample size in different studies, however, in the present study significant number of lesions were detected in both ultrasound and CT scan with very good agreement rate and low inter-observer variation, in addition, the detection of specific lesions was generally good. further studies with longer period can cover this subject and compare the ultrasound and CT in term versus preterm neonates . In conclusions Cranial CT scan and ultrasonography are good modalities in detection of brain abnormalities in term and preterm neonates and there was a good agreement between the two modalities , however, further studies with larger sample size, longer duration are suggested for further assessment and evaluation with particular comparison of the cranial CT and ultrasound findings in term and preterm neonates.

**Conflict of Interest** Author declared: None

**Source of Funding:** Self-funded

**Ethical Clearance:** Data of the participant neonates, were collected in accordance with the Helsinki declaration, Consents of caregiver (parents, or relative) to participate their neonates in the study were obtained. All official agreements and written informed signed consent of each participant were obtained prior to patients enrollment

**REFERENCES**


**Xilem Pinus merkusii as Martapura River Water Biofilter**

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**ABSTRACT**

People of South Kalimantan use river water for their daily needs. Martapura River has a level of contamination of *Escherichia coli* bacteria exceeding the threshold. Xylem conifers can be used as biofilter. *Pine merkusii* is a type of conifer plant that grows in South Kalimantan. The purpose of this study was to determine the differences in the value of MPN and TPC of Martapura river water and pathogenic bacteria before and after filtering treatment with xylem biofilter of stem *Pinus merkusii*. This type of research is true experimental method in the form of draft Posttest Only Control Group Design. The research material used was xylem from stem *Pinus merkusii* from pine forest in Banjarbaru and Pinus Banjar Regency. The research sample is the Martapura River water. The independent variable is Xilem stem *Pinus merkusii*. The dependent variable is the decrease in MPN coli feces, river water TPC and dissolved water *Klebsiella pneumonia*, *Pseudomonas aerogenosa*. The data obtained were tabulated and statistically analyzed by independent T test. MPN coli examination results of river water stools before and after treatment on average ≥ 2400/100 ml. TPC results of river water before treatment 5348 CFU /ml after treatment 9103 CFU / ml. TPC results of water dissolved by *Klebsiella pneumonia* before treatment 9724 CFU / ml, after treatment of 0 CFU/ml. TPC results of dissolved water *Pseudomonas aerogenosa* before treatment 6988 CFU/ml, after treatment of 1202 CFU/ml. The conclusion of the study there were no differences in the results of river water TPC before and after treatment with a significance value of 0.41 (>0.05), there were differences in TPC results of dissolved water *Klebsiella pneumonia* and *Pseudomonas aerogenosa*. with a significance value of 0.000 (<0.05) and with a significance value of 0.01 (<0.05). It is recommended to do research with a different type of xylem.

**Keywords:** xilem Pinus merkusii, biofilter, river water

**INTRODUCTION**

Indonesia has an average water requirement of 60 liters per capita. The community processes and refines dirty water in rivers, lakes and so on that are generally polluted to meet water needs. Most in developing countries rare surface water sources that meet quality standards for human consumption, many water sources are polluted by human excretion, animal excretion and industrial waste.

The scarcity of clean and safe drinking water is one of the main causes of human death in developing countries. Water pollution, the deadliest comes from biological: infectious diseases caused by pathogenic bacteria, viruses, protozoa, or parasites are the most common and widely related health risks with drinking water. The most common pathogens carried by water are bacteria (eg *Escherichia coli*, *Salmonella typhi*, *Vibrio cholerae*), viruses (eg adenoviruses, enteroviruses, hepatitis, rotavirus), and protozoa (eg *Giardia*). This pathogen causes child death and also contributes to malnutrition and inhibits child growth.

The World Health Organization reports that 1.6 million people die each year from diarrheal diseases due to lack of access to safe drinking water and sanitation basic. 90% of them are children under 5 years of age, especially in developing countries. Some barriers include the prevention of contamination, sanitation and disinfection needed to effectively prevent the spread of waterborne diseases.

Indonesia is a developing country covering many
provinces, most still rely on water from river water despite microbiological quality of the river water does not meet health requirements, test results MPN coli in Cede River in Yogyakarta, shows the content of the bacterium Escherichia coli in which more than 8,000 bacteria / 100ml. The ciliwung river in Jakarta also shows fecal coliform content exceeding the prescribed limit. Martapura River is a large river located in Banjarmasin, South Kalimantan Province, there are still residents of Banjarmasin Defecate (BAB) in the Martapura River causing the level of contamination of Escherichia coli bacteria to exceed the threshold.

Safe water for drinking water must be free from pathogenic organisms, toxic substances, excessive minerals and the remains of organic substances. Polluted water must be disinfected first, a lot of disinfection is done by the chlorination process after the water is coagulated - flocculation using Aluminum sulfate (Al₂(SO₄)₃, 14 H₂O). Chlorine has a high solubility and 700mg/l of water for disinfecting, in general, no harmful effects, such as causing odor, taste and effectively killing bacteria. At pH dependent chlorine can cause cancer because it produces tetrahalomethane compounds that can damage the endocrine system. There is a need for tools or materials that are natural that can be used as a natural filter that is safe and easily accessible to the community.

Research conducted by Karnik from the Massachusetts Institute of Technology in Cambridge shows that coniferous xylem can be used as a biofilter. This technique is easy to implement considering the material is easy to obtain, cheap, biodegradable and disposable, can remove bacteria from water with simple filtration based on the pressure of about 3 cm³ stems can filter water a few liters per day, enough to meet the needs of clean drinking water from one person. These results indicate the potential for plant xylem to overcome the need for pathogen-free drinking water in developing and resource-limited countries. *Pinus merkusii* is a type of conifer plant that is widely grown in Indonesia, including in South Kalimantan.

The background above shows the need for xylem research on *Pinus merkusii* as a biofilter on the Martapura River water. The purpose of this study was to determine the difference in the value of fecal MPN coli and TPC martapura river water, dissolved water ofbacteria *Klebsiella pneumoniae; Pseudomonas aerogenosa* before and after filtration treatment with xylem biofilter of stem *Pinus merkusii*.

**MATERIALS AND METHOD**

This type of research used in this study is actually an experimental method (true experiment) in the form of draft Posttest Only Control Group Design. The research material used was xylem of stem *Pinus merkusii*. The research material was obtained from pine forests in Banjarbaru and Pinus Island, Banjar Regency. The research sample is the Martapura River water.

The independent variable in this study is Xilem stem *Pinus merkusii*. The dependent variable in this study is the declining value of MPN Coli feces, TPC Martapura river water and dissolved water *Klebsiella pneumoniae, Pseudomonas aerogenosa* determination test was conducted in the laboratory of FMIPA Universitas Lambung Mangkurat. River water sampling was carried out at 6 points with repetition 5 times. The collection uses 5 liters of sterilized jerry cans.

Making xylem of stem *Pinus merkusii* by means of onestem *Pinus merkusii* measuring 20 cm long the outer layer is removed, then cut into pieces with a length of 1 cm and 1.5 cm in diameter.

Identifying Gram-negative pathogenic bacterial species by means of Martapura river water poured in a sterile bottle and taken by one ounce, isolated into agar EMB media and one ole was isolated in Mac Conkey agar media, incubated at 37 °C for 24 hours. Observed whether there are colonies that match the characteristics of gram-negative pathogens including *Klebsiella pneumoniae, Pseudomonas aerogenosa*. Gram and colony staining were carried out which led to the desired bacterial species followed by biochemical tests, after 24 hours followed by serology tests and VITEX tests performed feces MPN coli and river water TPC before biofilter filter. Prepared a plastic tub covered with existing water faucet in a sterile state, put 5 liters of Martapura River water and connected xylem of stems *Pinus merkusii* that had been prepared in the container faucet, left for 24 hours for the biofiltration process. Filtered water is stored in a sterile container. Carry out fecal MPN Coli and TPC examination on biofiltration water.

Examination of MPN Coli feces and TPC in dissolved water *Klebsiella pneumoniae, Pseudomonas aerogenosa* before and after filtering biofilter. The data obtained
were tabulated and statistically analyzed by independent T test to determine differences in fecal MPN coli, river water TPC, *Klebsiella pneumoniae* solution, solution *Pseudomonas aerogenosa* before and after the biofilter process.

**RESULTS AND DISCUSSION**

The adoption of the Martapura river water was carried out in six (6) points, namely at the upstream of the river, the middle of the river, and downstream of the river. Many samples of each point are 5 liters. A total of 2.5 liters from each point were mixed so that they were homogeneous and used as research samples. The sampling points can be explained in the following table:

### Table 1 Sampling Points for River Water

<table>
<thead>
<tr>
<th>Retrieval Points</th>
<th>Code</th>
<th>Sample Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hulu</td>
<td>Pasar Astambul</td>
</tr>
<tr>
<td>2</td>
<td>Tengah 1</td>
<td>Pondok Pasanten Darussalam</td>
</tr>
<tr>
<td>3</td>
<td>Middle2</td>
<td>Sungai Tabuk</td>
</tr>
<tr>
<td>4</td>
<td>Tengah 3</td>
<td>Sungai Lulut</td>
</tr>
<tr>
<td>5</td>
<td>Tengah 4</td>
<td>Banua Anyar</td>
</tr>
<tr>
<td>6</td>
<td>Downstream</td>
<td>of Basirih Bridge</td>
</tr>
</tbody>
</table>

The results of isolation of pathogenic bacteria from samples of Martapura river water were found in two bacteria, *Klebsiella pneumoniae* and *Pseudomonas aerogenosa*.

**MPN Coli Feces Test Results River Water Test**

### Table 2. MPN Coli Fecal

<table>
<thead>
<tr>
<th>River Water Samples</th>
<th>Examination Results MPN Coli Tinja (MPN/100ml)</th>
<th>Deuteronomy 1</th>
<th>Deuteronomy 2</th>
<th>Deuteronomy 3</th>
<th>Deuteronomy 4</th>
<th>Deuteronomy 5</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td></td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td></td>
<td>≥ 2400</td>
</tr>
<tr>
<td>No treatment</td>
<td></td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td></td>
<td>≥ 2400</td>
</tr>
<tr>
<td>(positive control)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard filter</td>
<td></td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td>≥ 2400</td>
<td></td>
<td>≥ 2400</td>
</tr>
<tr>
<td>(negative control)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TPC River Water Test Results**

### Table 3. The results of the examination TPC River water

<table>
<thead>
<tr>
<th>River Water Samples</th>
<th>Examination Results TPC (CFU/ml)</th>
<th>Deuteronomy 1</th>
<th>Deuteronomy 2</th>
<th>Deuteronomy 3</th>
<th>Deuteronomy 4</th>
<th>Deuteronomy 5</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td></td>
<td>2788</td>
<td>21034</td>
<td>14974</td>
<td>5248</td>
<td>1472</td>
<td>45516</td>
<td>9103</td>
</tr>
<tr>
<td>No treatment</td>
<td></td>
<td>16688</td>
<td>5248</td>
<td>1104</td>
<td>1924</td>
<td>1776</td>
<td>26740</td>
<td>5348</td>
</tr>
<tr>
<td>(positive control)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard filter</td>
<td></td>
<td>9596</td>
<td>339</td>
<td>401</td>
<td>384</td>
<td>792</td>
<td>11512</td>
<td>2302</td>
</tr>
<tr>
<td>(negative control)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TPC Test Results Dissolved Water *Klebsiella pneumoniae*

Table 4. Examination results TPC Suspended Water *Klebsiella pneumoniae*

<table>
<thead>
<tr>
<th>Dissolved Water <em>Klebsiella pneumoniae</em></th>
<th>Examination Results TPC (CFU/ml)</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deuteronomy 1</td>
<td>Deuteronomy 2</td>
<td>Deuteronomy 3</td>
</tr>
<tr>
<td>Treatment</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No treatment (positive control)</td>
<td>7800</td>
<td>9560</td>
<td>9600</td>
</tr>
<tr>
<td>Standard filter (negative control)</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Dissolved Water Test Results *Pseudomonas aerogenosa*

Table 5. TPC Suspended Water Test Results *Pseudomonas aerogenosa*

<table>
<thead>
<tr>
<th>Dissolved Water <em>Pseudomonas aerogenosa</em></th>
<th>Examination Results TPC (CFU/ml)</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deuteronomy 1</td>
<td>Deuteronomy 2</td>
<td>Deuteronomy 3</td>
</tr>
<tr>
<td>Treatment</td>
<td>780</td>
<td>950</td>
<td>740</td>
</tr>
<tr>
<td>No treatment (positive control)</td>
<td>4360</td>
<td>3080</td>
<td>5600</td>
</tr>
<tr>
<td>Standard filter (negative control)</td>
<td>600</td>
<td>420</td>
<td>1400</td>
</tr>
</tbody>
</table>

**STATISTICAL TEST RESULTS**

The equipment used for water disinfection requires several requirements which are the main reference. The requirements put forward by Peter Varbanets there are four (4) namely, first the performance of equipment in terms of the ability to effectively remove pathogenic microbes. Both devices are easy to use, do not require complicated steps for operation and maintenance. All three equipment are sustainable, can be produced locally, use of chemicals that are small and do not use energy consumed. All four devices are generally accepted.

Low-cost water treatment in developing countries generally uses chlorine disinfection, sunlight disinfection, chlorine disinfection with a combination of coagulation, or ceramic filtration. Chlorine used for disinfection is a biocide that effectively reacts with organic substances to produce carcinogenic substances against pathogenic microbes.

Disinfection using sunlight based on the principle of ultraviolet light radiation can effectively inhibit *Cryptosporidium parvum* but only for disinfection water with a low turbidity limit. Sunlight is also not effectively used to inhibit viruses. Filtration using ceramic filters is effective for removing pathogenic microbes, but their effectiveness against viruses is low.

Research on filtration techniques using pine xylem by Boutilier proved to have been able to filter bacteria. This study also shows that there is a xylem filtering power of *Pinus merkusii* against certain bacteria. The underlying research results are that there are differences in treatment and non-treatment TPC test results in the solution of *Klebsiella pneumonia* and *Pseudomonas*.
aerogenosa bacteria, although the results of the river water samples obtained no difference.

Xylem plants are porous materials that regulate the flow of water in plants, from the roots of kepucuk\textsuperscript{13}. Xylem pores are small, usually in units of nanometers (nm), this is useful so that water that flows in this small channel does not occur (cavitation)\textsuperscript{14}.

Pine belongs to the conifer plants, with a sectional stem is composed largely of xylem tissue\textsuperscript{3}, in contrast to woody trees that have xylem tissue is limited to a part surrounded by bark\textsuperscript{13}.

Research\textsuperscript{3} shows that xylem filters that have been used for filtration, after cutting lengthwise and examined by fluorescence microscopy, there are bacteria that accumulate in xylem pores. Bacteria are found in the xylem filter section with a distance of only a few millimeters from the tip of the solution being inserted.

Particles larger than 100 nm are retained in the xylem filter sieve well. Particles measuring \(\leq 70\) nm are not retained and pass through the xylem filter\textsuperscript{3}. Bacteria \textit{Klebsiella pneumonia size} \(\leq 70\) nm (2\(\mu\)m x 0.5\(\mu\)m), but this bacteria has a large capsule measuring 160 nm\textsuperscript{15} so that it is possible to retain the xylem filter \textit{Pinus merkusii}. Bacteria \textit{Klebsiella pneumoniae} can be found in the human nasoparing and there is also a free environment such as surface water, waste water and soil\textsuperscript{16}.

\textit{Klebsiella pneumonia} generally causes pneumonia, usually in the form of bronchopneumonia and also bronchitis. Patients with this infection tend to develop lung abscesses, cavitation, empyema and pleural adhesions. Death rate is around 50\% despite antimicrobial therapy. Patients with alcoholism and bacteremia die level increases to 100\%\textsuperscript{17}.

This study shows that xylem \textit{Pinus merkusii} can also filter \textit{Pseudomonas aerogenosa}. \textit{Pseudomonas aerogenosa} measuring 0.5-0.8 \(\mu\)m x 1.5-3 \(\mu\)m\textsuperscript{18} \textit{Pseudomonas aerogenosa} can be found in environments such as soil, water, humans, animals, plants, waste, and hospitals\textsuperscript{19}. \textit{Pseudomonas aerogenosa} is an opportunistic bacterium, usually in nosocomial infections in individuals with decreased immunity. Causes of respiratory tract infections, urinary tract, burns, and wounds\textsuperscript{18}.

**CONCLUSION**

The average value of MPN coli feces in Martapura river water before and after being filtered with xylem \textit{Pinus merkusii} \(\geq 2400/100\) ml.

The average value of TPC Martapura river water before being filtered with xylem stems \textit{Pinus merkusii} 5348 CFU / ml, after filtering 9103 CFU / ml. There was no significant difference in the TPC value of river water with a significance value of 0.41 (> 0.05)

TPC value in the water dissolved by \textit{Klebsiella pneumoniae} before being filtered with xylem ofstem \textit{Pinus merkusii} 9724 CFU / ml, after filtering 0 CFU / ml. There were significant differences in the TPC value of dissolved water \textit{Klebsiella pneumoniae} with a significance value of 0.000 (<0.05)

TPC value in water dissolved \textit{Pseudomonas aerogenosa} before being filtered with xylem ofstem \textit{Pinus merkusii} 6988 CFU / ml, after filtering 1202 CFU / ml. There are significant differences in the TPC value of dissolved water \textit{Pseudomonas aerogenosa} with a significance value of 0.01 (<0.05)

**Gratitude**

This research received funding from research training of health personnel in 2015, thus conveyed appreciation for Politeknik Kesehatan Kemenkes Banjarmasin institution and stakeholders.

**Evaluative Clearance:** Taken From Health Research Ethics Committee Politeknik Kesehatan Banjarmasin

**Conflict of Interest:** Nil

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Factors Influencing Health Conservation of Middle-aged Men in Korea

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ABSTRACT

Purpose: The purpose of this study was to examine the relationship among perceived health status, stress, lifestyle habits, self-esteem, self-efficacy, wisdom and health conservation, and to analyze the effects of them on health conservation. Methods: Subjects of this research are 134 middle-aged men. Data were collected by using questionnaires which included demographic characteristics, correlated factors and health conservation. Data were analyzed using descriptive statistics, t-test, ANOVA, Pearson’s correlation coefficients, and stepwise multiple regression. Results: There were significant relationship between health conservation and the following independent variables: stress ($r=-.343$, $p<.001$), lifestyle habits ($r=.295$, $p=.001$), self-esteem ($r=.398$, $p<.001$), self-efficacy ($r=.471$, $p<.001$), and wisdom ($r=.714$, $p<.001$). The variable affecting the health conservation of subjects was wisdom and explanatory power was 50.7%. Conclusion: It is important for middle-aged men to live a wise life in everyday life to preserve their health. Especially, being wise subjects is possible through experiences that have overcome difficulties in their own lives by raising empathy and self-reflection for others, so experts need help them to live a life that can expand and develop these factors.

Keywords: Middle-aged men, Health conservation, Stress, Lifestyle habits, Self-efficacy, Wisdom

INTRODUCTION

According to the Population and Housing Census in 2015, the population was 51,107,000, and due to the persistence of low fertility and aging, the youth population declined and the number of middle-aged and elderly population increased sharply, reaching 482,000, and the median age rose to 41.2. Middle-age is the age group below 40-64 years. This period is the golden age of life with economic stability and mental relaxation unlike early adults where there are freedom and wisdom to reflect on oneself, and physically, through the symptoms of climacterium, changes due to the aging process become prominent, and the limits of human existence are experienced throughout the body. Socially and psychologically, impulse of the new self, the role change in the family, and conflicts and imbalances caused by external environment occur, and people experience the challenge of reflection on their lives and the identity of their self as they worry about depression and death.

In particular, middle-aged men in Korea are more likely to experience sudden death in their daily lives than in other age groups, and they may be said to be in a state of health risk, through persistent lifestyle habits such as high fat dietary intake, drinking and smoking, excessive stress in home and society, excessive stress on work, and lack of rest and exercise. Therefore, nurses need to provide middle-aged men with nursing care that can improve their health, prevent disease and preserve their health.

Health conservation is the maintenance of physical, mental and social well-being and a balance of physical, mental and social psychological integrity and when conservation is achieved, people are harmonious and adaptable.

Among previous studies, there are studies on depression, stress, health promoting behaviors, and life satisfaction among middle-aged men, but there is a lack...
of research that explains the overall health dimension such as health conservation or various factors of health. Middle age adults perceived their health condition as a major influence on health conservation⁶ and considering that health awareness is a major factor in changing behavior, it needs to be included in this study. For middle-aged men, stress and lifestyle are important factors in health-related quality of life.⁷ And as for male elderly, self-esteem is the most influential factor for successful aging and for middle-aged men, self-esteem can also be deduced to have a major impact on health conservation. When people have self-efficacy that they can do something by themselves, they can preserve their health by doing something that leads to health.⁸ In addition, since the concept of wisdom in life is a function of the mind that sees the reason or the good and evil of things, and includes positive qualities such as self-unification and maturity, judgment and interpersonal skills, and excellent understanding of life, it is considered to be the core of human development.⁹ In a study of middle-aged adults, women, and elderly people with chronic diseases, wisdom was found to be an important factor in health conservation.⁴,⁶,⁸,¹⁰ The purpose of this study was to investigate the relationship between perceived health status, stress, lifestyle habits, self-esteem, self-efficacy, wisdom and health conservation, and investigate the effect of them on health conservation of subjects to provide basic data on the development of nursing interventions to improve the health conservation of subjects.

**METHOD**

**Subjects**

The subjects of this study were convenience extraction of 134 middle-aged men who live or work in Gyeongbuk C and M cities. The sample size was calculated using the G Power 3.1.17 program using 0.15 effect size, 0.05 significant level, 0.90 power, and 6 predictors.

**Instruments**

*Perceived Health Status*

This study utilized the 3-question tool developed by Speake, Cowart and Pellet.¹¹ A higher score means that they perceive that their health status is better. Cronbach’s α was .91.

*Stress*

This is a measure developed by Cohen, Kamark, & Mermelstein and translated by Park & Seo.¹² The higher the total score, the higher the perceived stress level. Cronbach’s α was .83.

*Lifestyle Habits*

Lifestyle habits instrument which was an adaptation by Ro¹³ from the health promotion behavior evaluation index by Wilson and Ciliska was used. It was composed of a total of 25 questions. In the study, reliability was .74.

*Self-esteem*

The tool was used by Jeon¹⁴ to translate the self-esteem scale developed by Rosenberg. This scale is a total of 10 questions. The higher the score, the higher the self-esteem, from the total average rating of 1 to 4 points. Cronbach’s α was .89.

*Self-efficacy*

The tool was used by Noh¹⁵ to translate the general self-efficacy scale developed by Chen, Gully, & Eden. It is a 5-point Likert scale with a total of 8 questions, and it means that the score is high, the score is high. Cronbach’s α was .93.

*Wisdom*

To measure the wisdom of middle-aged men, this study measured it with the ‘wisdom scale of Korean elderly people’ developed by Sung, Lee and Park.¹⁶ A higher score indicates that the degree of wisdom perceived by the middle-aged men were higher. Cronbach’s α was .90.

*Health Conservation*

Health conservation is a physically, mentally, socially and psychologically integrated object that maintains the balance. To measure the health conservation of subjects, this study measured it with the health conservation scale developed by Sung⁵. A higher score indicates that the degree of health conservation was higher. Cronbach’s α was .85.

**Data collection**

The data for this study were collected from May 21th to June 25th in 2018. We visited the parks and sports facilities located in C, M city in Gyeongbuk to explain
the purpose of the research to the people who met the standards of the targets of the survey and received written agreement from them. After that, we distributed the structured questionnaires and had the respondents fill them out on their own.

**Ethical Consideration**

This study obtained an approval from the Institutional Review Board of K University on the content and methodology (IRB No. KNU_IRB_2018-04). This study conformed to the research ethics guideline during the research period. The purpose and objectives of the study were fully explained to the subjects before data collection. The subjects were clearly told that they could drop out or cease anytime during the research period. Then, the questionnaire was distributed after they gave written consent.

**Data analysis**

Data were analyzed using IBM SPSS Statistics 23 program. The general characteristics of the subject were analyzed with frequency and percentage. Heath conservation and related variables of the subjects were analyzed with descriptive statistics. To analyze the difference in the health conservation by the general characteristics, t-test and ANOVA were used. The correlation among the health conservation and variables was analyzed with Pearson’s correlation coefficient. To identify the factor having influence, the multiple regression analysis was used.

**RESULTS**

General Characteristics of Subject and Difference in Health Conservation by General Characteristics

The subjects participated in this study were 134 and for the age, the person of 50-59 years old were 82 persons (61.2%), the persons of under 49 years old or over 60 years were 52 persons and the average age was 52.17(5.22) years old. Most of the 115 subjects had spouses (85.8%). The education level of the subjects was 70 (52.2%) in the case of having a university or higher education level. As a result of comparing the difference of health preservation of middle-aged men according to general characteristics, there was a statistically significant difference depending on the degree of education school (t=3.388, p=.037) (Table 1).

### Table 1. The General Characteristics of the Subjects (N=134)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>N(%)</th>
<th>Health conservation</th>
<th>M±SD</th>
<th>t/F(p)</th>
<th>Scheffe test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Under 49 years</td>
<td>40(29.9)</td>
<td>2.84(0.26)</td>
<td>1.438(.241)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50~59</td>
<td>82(61.2)</td>
<td>2.77(0.22)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over 60 years</td>
<td>12( 9.0)</td>
<td>2.74(0.36)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>Yes</td>
<td>115(85.8)</td>
<td>2.79(0.26)</td>
<td>0.477(.634)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19(14.2)</td>
<td>2.76(0.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td>Below primary school graduate a</td>
<td>2(1.5)</td>
<td>2.78(0.46)</td>
<td>3.388(.037)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle-High School graduate b</td>
<td>62(46.3)</td>
<td>2.73(0.23)</td>
<td>b&lt;c</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College graduate or higher c</td>
<td>70(52.2)</td>
<td>2.84(0.24)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job</td>
<td>Yes</td>
<td>123(91.79)</td>
<td>2.78(0.25)</td>
<td>-1.456(.170)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>11(8.21)</td>
<td>2.86(0.17)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>Yes</td>
<td>63(47.0)</td>
<td>2.81(0.24)</td>
<td>0.971(.333)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>71(52.9)</td>
<td>2.77(0.25)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of disease</td>
<td>None</td>
<td>86(64.2)</td>
<td>2.77(0.24)</td>
<td>-1.206(.231)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>More than one</td>
<td>48(35.8)</td>
<td>2.82(0.26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular exercise</td>
<td>Regular</td>
<td>89(66.4)</td>
<td>2.81(0.25)</td>
<td>1.694(.094)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Degree of the Perceived Health Status, Stress, Lifestyle Habits, Self-esteem, Self-efficacy, Wisdom and Health Conservation of Subjects

The perceived health status of subjects was 3.35. Stress was 2.55. Lifestyle habits were 3.49. Self-esteem was 3.76. Self-efficacy was 3.63. Wisdom was 3.00. Health preservation was 2.78 (Table 2).

Table 2. Degree of Health Status, Stress, Lifestyles Habit, Self-esteem, Self-efficacy, Wisdom and Health Conservation of Subjects (N=134)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Possible range</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived health status</td>
<td>1-5</td>
<td>3.35(0.79)</td>
</tr>
<tr>
<td>Stress</td>
<td>1-5</td>
<td>2.55(0.53)</td>
</tr>
<tr>
<td>Lifestyle Habits</td>
<td>1-5</td>
<td>3.49(0.39)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>1-5</td>
<td>3.76(0.59)</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>1-5</td>
<td>3.63(0.57)</td>
</tr>
<tr>
<td>Wisdom</td>
<td>1-4</td>
<td>3.00(0.28)</td>
</tr>
<tr>
<td>Emphatic emotion</td>
<td>1-4</td>
<td>3.01(0.28)</td>
</tr>
<tr>
<td>Introspection</td>
<td>1-4</td>
<td>3.06(0.34)</td>
</tr>
<tr>
<td>Overcoming Life Experience</td>
<td>1-4</td>
<td>2.88(0.33)</td>
</tr>
<tr>
<td>Health conservation</td>
<td>1-4</td>
<td>2.78(0.25)</td>
</tr>
<tr>
<td>Personal integrity</td>
<td>1-4</td>
<td>2.76(0.29)</td>
</tr>
<tr>
<td>Energy conservation</td>
<td>1-4</td>
<td>2.77(0.29)</td>
</tr>
<tr>
<td>Structural integrity</td>
<td>1-4</td>
<td>2.91(0.32)</td>
</tr>
<tr>
<td>Social integrity</td>
<td>1-4</td>
<td>2.71(0.33)</td>
</tr>
</tbody>
</table>

Correlation of Perceived Health Status, Stress, Lifestyle Habits, Self-esteem, Self-efficacy, Wisdom and Degree of Health Conservation of Subjects

Health preservation in middle-aged men, stress ($r=−.343$, $p<0.01$), lifestyle habits ($r=.295$, $p=.001$), self-esteem ($r=.398$, $p<0.001$), self-efficacy ($r=.471$, $p<.001$) and wisdom ($r=.714$, $p<.001$) were statistically relevant at a significant level (Table 3).
Table 3. Correlation of Perceived Health Status, Stress, Lifestyle Habits, Self-esteem, Self-efficacy, Wisdom and Degree of Health Conservation of Subjects (N=134)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Perceived health status r(p)</th>
<th>Stress r(p)</th>
<th>Lifestyle habits r(p)</th>
<th>Self-esteem r(p)</th>
<th>Self-efficacy r(p)</th>
<th>Wisdom r(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health conservation</td>
<td>.128(.071)</td>
<td>-.343(&lt;.001)</td>
<td>.295(.001)</td>
<td>.398(&lt;.001)</td>
<td>.471(&lt;.001)</td>
<td>.714(&lt;.001)</td>
</tr>
</tbody>
</table>

**Factor Having Influence on Health Conservation of Subjects**

Regression analysis is analyzed by adding independent variables and education levels. In addition, before performing the regression analysis, the multicollinearity was verified. The variance inflation factor of the research variables was 1.000 not greater than 10 and since in the results of testing the autocorrelation using Durbin-Watson, it was 1.572 and the tolerance limit was 1.000 showing that there is not value of 0.1 or less, all the variables represented not to have problem of multicollinearity.

In the results of examining the factor having influence on the health conservation, the corrected R² of the regression model was .507 and the explanatory power of the independent variable was 50.7%, the goodness of fit (F=137.658, p<.001) of the regression model was shown significant and the significant factor having influence was 1, among which the wisdom had explanatory power of 50.7% (β=.714, t=11.733, p<.001) (Table 4).

Table 4. Factor Having Influence on Health Conservation of Subjects (N=134)

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t(p)</th>
<th>Adj. R²</th>
<th>F(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>.900</td>
<td>.161</td>
<td>5.579</td>
<td>.001</td>
<td>.507</td>
<td>137.658</td>
</tr>
<tr>
<td>Wisdom</td>
<td>.629</td>
<td>.054</td>
<td>.714</td>
<td>11.733</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

The results of this study showed that subjects graduated from college or graduate school showed better health conservation than subjects graduated from middle or high school. It was similar to the result of studying the quality of life related to health for working men, where there was a difference in the quality of life related to health among men with higher education level than men with lower education level, and the results of a study of elderly people with chronic illnesses showed similar differences in the degree of health conservation by educational background. It will be necessary to continue education using health-related experts.

In general, the degree of health-related variables of middle-aged men is moderate. In order to overcome and adapt to physical aging and loss, one must perform health conservation activities to lead self-directed life after middle age.

In middle-aged men, health conservation was higher when lifestyle habits were higher, when self-esteem and self-efficacy were higher, with wiser life, when health conservation was better, and when there was less stress. Especially, wisdom was found to be the most important factor in the health conservation of middle-aged men and the explanation power of wisdom was as high as 50.7%.

In a study, men in the workplace reported a positive correlation between health-related quality of life and lifestyle habits and self-esteem, and stress correlated negatively and these results were similar to those of my study. Lifestyle habits in general are influenced by the amount of unhealthy behavior and because stress can lead to fatigue and depression and can lead to variable.
disease,\textsuperscript{18} it can cause difficulties in preserving health.

Health conservation was highly correlated with self-efficacy and wisdom.\textsuperscript{10} Therefore, middle-aged men should have healthy lifestyle habits in their daily lives and act to increase their self-esteem and self-efficacy, and it is desirable to manage their health in a way that minimizes stress. Especially, the variable that had the most important effect on health conservation was wisdom. In a study of health conservation,\textsuperscript{19} the self-efficacy of the elderly was positively correlated with the meaning of life, and the meaning of life was the most important factor influencing health conservation. Wisdom is a mental function that distinguishes things from goodness and good and evil, and includes positive qualities such as self-integration and maturity, judgment and interpersonal skills, and an excellent understanding of life,\textsuperscript{8} and the emotional sentiment, self-reflection, and experience of overcoming the life are considered to be similar to each other. Therefore, it is very important to understand the meaning of life and to live wisely to preserve the health of middle-age and old age.

In addition, the concept of wisdom is considered to be an important concept for elderly or women, but it is a concept that can be applied to all human beings because it is positive qualities such as self-integration and maturity, as well as deep understanding of life. Therefore, it is a concept that affects the health of middle-aged men in a very important way. Therefore, it is necessary to find ways to improve communication and wisdom with nurses and other specialists so that they can live wisely in everyday life.

**CONCLUSION**

In this study, There is significance in the study that it was found wisdom is also an important health conservation influence factor for middle aged men. However, this study was aimed at a sample of subjects in Gyeongbuk, and therefore, it is necessary to pay close attention to the extension analysis, and there is also a need to expand the number of subjects and areas to be studied in the future and to search for unidentified factors.

**Conflict of Interest and Source of Funding:** The authors declared no conflict of interest. This work was supported by the research grant of the Kongju National University in 2018.

**Ethical Clearance:** The data of this study was analyzed after review and approval of Institutional Review Board in K University (IRB No: KNU_IRB_2018-4)

**REFERENCES**


Micro Oxidation Sterilization by Non-Thermal Plasma Technology

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ABSTRACT

This study was carried out to compare the efficiency of sterilization by using non-thermal plasma technology with other traditional sterilizations and to study more on the concept of non-thermal plasma technique on kitchenware. Different kitchenware was used during this study. They were stainless steel plates, plastic plates and frying pan. Escherichia coli (E. coli) and Staphylococcus aureus (S. aureus) were used as contaminants and were grown on Brain Heart Infusion agar and broth (BHI) medium. Standard Gram staining method and light microscopy were used to observe the characteristics of the bacteria. Plasma chamber was used to expose the kitchenware directly to plasma. They were exposed at different durations. There was completely no growth of bacteria after 30 minutes of exposure to plasma for all three different conditions applied on those specific kitchenware suggesting this to be the optimum time point reach by this plasma chamber for sterilization purpose.

Keywords: Micro oxidation, sterilization, Plasma technology, non-thermal.

INTRODUCTION

Sterilization is the process of killing all forms of microbial existence in or on particular objects. In microbiological term, sterile material represents no living organisms at all [1]. One type of sterilization method is chemical sterilization where this technique occupies a treatment of preparations to be sterilized with selected chemicals in either gaseous or liquid form. Gaseous sterilization is done by exposure to a gas that destroys microorganisms. The most commonly used gas for sterilization is ethylene oxide and formaldehyde [2]. However, ethylene oxide has some drawbacks as it residues being absorbed on devices after sterilization process where it is highly toxic, carcinogenic and mutagenic. Same goes with formaldehyde too [3]. So, gaseous sterilization by using plasma is the best. It is a safer technique to be applied and free from harmful properties compared to the other types of gaseous used before.

Plasma is an incompletely or entirely ionized gas comprising of various elements, such as electrons, ions, atoms, and molecules [4]. It is an efficient biological disinfectant [5] for microorganisms. There are two categories of plasma which are thermal plasma and non-thermal plasma. Thermal plasma is where almost all its elements are at equilibrium condition. The non-thermal plasma is not in the equilibrium condition. It differs significantly between the electrons and the other particles such as ions, atoms, and molecules. Non-thermal plasma
is also known as cold plasma, produce a variety of reactive constituents, including charged particles and UV radiation, without increasing temperature. Oxidation is a reaction of a substance with oxygen as the electrons were lost during the oxidation process. These tiny substances converted into volatile compounds that can be pumped away. It also referred as micro oxidation.

Since, non-thermal plasma (NTP) was reported to have shown advantages such as using low temperature and under appropriate situation, injury of the objects or materials can be reduced, used for inactivation of surface contaminants, eliminate the yield of toxic by-product and also affordable cost effective methods, therefore, our aim of this study were to compare the efficiency of sterilization by using non-thermal plasma technology with other traditional sterilizations and to study more on the concept of non-thermal plasma technique on kitchenware.

MATERIALS AND METHOD

Preparation of culture media and bacterial strains

The Brain Heart Infusion agar and broth (BHI) medium were prepared based on needs. Escherichia coli and Staphylococcus aureus were grown on Brain Heart Infusion (BHI) broth medium with suspension of 10 ml at 37°C for 24 h.

Contamination of Surfaces

E. coli and S. aureus were employed as the target to be sterilized. In this experiment, the kitchenware chosen to be used were stainless steel plate, plastic plate and frying pan. Three items of each kitchenware would be sterilized in four different time points in three variable types of condition each. The three conditions applied are (1) normal washing without any bacteria inoculated on its surface, (2) inoculation with E. coli on each surfaces of kitchenware and (3) inoculation with S. aureus on each surfaces of kitchenware by using swabbing technique.

Chamber Cleaning

Sterile the chamber surface with alcohol swab to avoid any contamination during the experiment.

Plasma Treatment

The plasma generator was set at 110V and 50-Hz frequency for all experiments. All the kitchenware (control and contaminated surfaces) were introduced into the plasma chamber for 10, 20 and 30 minutes duration. These plates were exposed directly to the plasma. At a certain pressure, sterilization gases (air, O2, H2O2, N2, H2O) were fed into the chamber, separately and were allowed to flow at a specific rate.

After plasma treatment, surface of all kitchenware used were swabbed by using sterile cotton swab on BHI agar medium before and after located in the plasma chamber. Then all the petri dishes were incubated for 24 hours at 37°C. Sterilization effect of plasma O2 was inspected by comparing the number of colonies with and without plasma treatment.

Characterization of experiment (Confirmation test)

Gram staining and microscopic morphology observation were used to observe the bacteria.

Gram Staining

It is a differential staining technique used to characterize bacteria as Gram positive and Gram negative. Standard Gram staining method was used. The fixed bacterial smear is subjected to Crystal Violet, Iodine Solution, Alcohol (decolorizing agent) and Safranin respectively. Gram-positive bacteria retain crystal violet and hence appear deep violet in color, while Gram negative bacteria lose the crystal violet and are counterstained by the Safranin. Hence they appear red in color. After Gram staining bacteria were observed under a Light Microscope to observe their shape and arrangements.

RESULT AND DISCUSSION

Based on the results obtained from the experiment, the condition of normal washing for stainless steel plate shows a few colonies grow on the media at 0 minute before put into the plasma chamber and the colonies become fewer at 10 minutes after put into the chamber. No colony grows at 20 minutes and 30 minutes after plates were put into the plasma chamber. Another condition is contamination of plate surface with E. coli strains show the growth of colonies all over the media at 0 minute before the plate was put into the chamber and the colonies become lesser at 10 minutes after put into the plasma chamber. There are totally no colony grows at 20 and 30 minutes’ time points. For surface contamination with S. aureus, the results obtained same
with the \textit{E. coli} contamination before. So, overall of these three conditions show no colony grows at 30 minutes after put the plate into plasma chamber. The result has been summarized and can be referred in \textbf{Table 1}.

\textbf{Table 1: Experiments carried out on Stainless Steel Plates}

<table>
<thead>
<tr>
<th>Type of condition</th>
<th>Before placed in the chamber</th>
<th>After placed in the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Normal washing</td>
<td>Few colonies grow on media</td>
<td>Fewer colonies grow than before (0 min)</td>
</tr>
<tr>
<td>\textit{Escherichia coli}</td>
<td>Colonies grow overall the media</td>
<td>Less colonies grow than before (0 min)</td>
</tr>
<tr>
<td>\textit{Staphylococcus aureus}</td>
<td>Colonies grow overall the media</td>
<td>Less colonies grow than before (0 min)</td>
</tr>
</tbody>
</table>

These 3 types of condition were also applied on another kitchenware which is plastic plate and frying pan. The results were shown in \textbf{Table 2} and \textbf{Table 3} below.

\textbf{Table 2: Experiments carried out on Plastic Plates}

<table>
<thead>
<tr>
<th>Type of condition</th>
<th>Before placed in the chamber</th>
<th>After Placed in the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Normal washing</td>
<td>No colony grows</td>
<td>No colony grows</td>
</tr>
<tr>
<td>\textit{Escherichia coli}</td>
<td>Colonies grow overall the media</td>
<td>No colony grows</td>
</tr>
<tr>
<td>\textit{Staphylococcus aureus}</td>
<td>Colonies grow overall the media</td>
<td>Less colonies grow than before (0 min)</td>
</tr>
</tbody>
</table>

\textbf{Table 3: Experiments carried out on Frying Pan}

<table>
<thead>
<tr>
<th>Type of condition</th>
<th>Before placed in the chamber</th>
<th>After Placed in the chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 min</td>
<td>10 min</td>
</tr>
<tr>
<td>Normal washing</td>
<td>No colony grows</td>
<td>No colony grows</td>
</tr>
<tr>
<td>\textit{Escherichia coli (E. coli)}</td>
<td>Colonies grow overall the media</td>
<td>No colony grows</td>
</tr>
<tr>
<td>\textit{Staphylococcus aureus (S. aureus)}</td>
<td>Colonies grow overall the media</td>
<td>Less colonies grow than before (0 min)</td>
</tr>
</tbody>
</table>

The colonies grown were subjected to Gram staining which showed Gram positive cocci in clusters. This microorganism is facultative anaerobes and is expected to be *Staphylococcus aureus*.

As there are completely no colony grows at each 30 minutes for all three different conditions applied on those specific kitchenware, so this is the optimum time point reach by this plasma chamber for sterilization purpose.

Plasma O$_2$ technology produces a corona-effect without sparking. Each tube has 100 discharge points producing an abundant stream of oxygen plasma for effective and continuous sterilization and purification of air and surfaces. The unit produces a controlled and continuous high energy electron discharge across the glass wall of the plasma tube. This splits the oxygen molecules in the air to form negatively-ionized oxygen plasma. One of the oxygen radicals found in the plasma include hydrogen peroxide (H$_2$O$_2$), a very powerful disinfectant and cleanser. When it encounters bacteria, it quickly oxidizes some of the components of the cell membrane causing the bacteria to die quickly. Therefore, it could be a very efficient biocidal against bacteria. The plasma treatment can effectively inactivate a wide range of microorganisms including spores and viruses. This low-pressure oxygen plasma has been shown to degrade lipids, proteins and DNA of cells.

The plasma chamber is also not an ozone-generator. Ozone generators produce high levels of ozone which are toxic to human. The plasma chamber complies with the World Health Organization (WHO) standards on ozone emission (less than the permitted level of 0.05ppm).

Some of the general characteristic of this plasma chamber are - (1) using the non-thermal plasma technology, (2) small in size, compact and silent chamber, (3) consumed low energy, (4) designed for 24 hours operation and (5) maintenance-free.

The plasma is highly reactive and purifies both air and surfaces by killing bacteria and viruses, 98% odor neutralization and toxic gases, cleansing the air of dust and particulates, reduce aerobic bacteria, mold and fungus up to 90% germ sterilization and freshening the air with negative ions.

**CONCLUSION**

Cold plasma treatment is a promising technology which acts rapidly and does not leave toxic residual on processed parts of kitchenware (on its surface). The temperature rise also can be kept to an acceptable level. The cold plasma is an emerging disinfection method that approach for reducing the microbial populations on the surface of kitchenware at 30 minutes as the optimum time taken.

**Ethical Clearance**- Not required  
**Source of Funding**- Self  
**Conflict of Interest** - Nil

**REFERENCES**

Practical and Simple Method in Measurement of Forearm Muscle Fatigue in Computer Operator

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¹Health Polytechnic of Makassar, Indonesia, ²Assistant Professor, UIPS- Department at Chandigarh University, Mohali, India, ³Health Polytechnic of Surabaya, Indonesia

ABSTRACT

Fatigue is a problem experienced by every worker, especially computer operators that until now cannot be overcome. Various methods used in analyzing the occurrence of muscle fatigue under the computer operator, such as handgrip and lactic acid blood plasma levels. This study aimed to find a method of measuring muscle fatigue in computer operators that can be applied in the field or workplace with the principle of simple, fast and cheap without ignoring the level of accuracy. The results showed that there was a correlation between the measurement of handgrip method with a lactic acid concentration of blood plasma to muscle fatigue, where p = 0.000 <0.05 with r = 0.667. Furthermore, it can be concluded that measurement of handgrip method and lactic acid blood plasma level as a fast, simple and cheap method can be used as a parameter to determine the fatigue of the forearm muscle of computer operator after working in the computer.

Keywords: Fatigue, Handgrip, Lactic acid level

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Fatigue is a problem experienced by every worker, especially computer operators that until now cannot be overcome. Various methods used in analyzing the occurrence of muscle fatigue under the computer operator, such as handgrip and lactic acid blood plasma levels. This study aimed to find a method of measuring muscle fatigue in computer operators that can be applied in the field or workplace with the principle of simple, fast and cheap without ignoring the level of accuracy. The results showed that there was a correlation between the measurement of handgrip method with a lactic acid concentration of blood plasma to muscle fatigue, where p = 0.000 <0.05 with r = 0.667. Furthermore, it can be concluded that measurement of handgrip method and lactic acid blood plasma level as a fast, simple and cheap method can be used as a parameter to determine the fatigue of the forearm muscle of computer operator after working in the computer.
working for 4 hours. The research was conducted in 2017 at the regional office of the Directorate General of Taxes of South Sulawesi. The main sources required in this study were: 1) handgrip to measure the ability of muscle contraction, 2) accutrend to measure blood plasma lactate acid level, 3) research subjects are male employees aged between 25-40 years, have no history of disease with physician recommendations, free from musculoskeletal disorders and working on the computer at least 4 hours, so a large sample 175 people.

Evidence of the effectiveness of this simple method was implemented with several steps: 1) validation of measuring instruments by comparing the results of standard laboratory tests to determine the accuracy and accuracy of the measuring tool to be used, 2) measure muscular contraction muscle capability of computer operator by using handgrip before and after work in computer for 4 hours, 3) measure blood lactate acid level by taking blood + 0.5 ml, before and after work on computer 4 hours, 4) compare result of measurement of both method to know the increase of lactic acid level of blood plasma and decreased ability of muscle contraction.

**FINDINGS**

The selection of measurement methods as parameters of muscular arms fatigue is based on the theory that functional ability of the forearm grip is influenced by fatigue\(^6\). Muscle strength is an important component in assessing muscle activity, which increases or decreases muscle strength can affect muscle performance\(^6,7\). Therefore, the measurement of grip strength allows in determining the parameters of the ability of arm muscle activity\(^8\). At lactic acid levels showed that there was a correlation between elevated lactic acid levels of blood plasma with the decreased ability of muscle contraction\(^9\). Increased levels of lactic acid in the muscle will affect the ability of muscle contractility, but the increase in lactate in extracellular level indirectly affects the ability of muscle contraction. A decrease in blood pH will affect muscle contraction ability\(^10,11\). Thus the method of handgrip and lactic acid blood plasma levels method can be used as a parameter of muscle fatigue in the forearm of the computer operator.

In the various literature described various methods used in determining the presence or absence of fatigue of a muscle or muscle group. Good measurements using electrical, chemical, mechanical methods and questionnaires\(^2,4\). The method is used based on the purpose and type of fatigue that occurs. Muscle fatigue can generally be used with electrical, chemical and mechanical methods\(^5\). In field research, the measurement of muscle fatigue determination should be used as a simple method, fast and cheap by not ignoring the level of accuracy in the measurement\(^1\). Based on the analysis of objectives and benefits, the researchers choose the parameter method in determining fatigue, the method handgrip, and lactic acid blood plasma levels. Both methods show the difference between measurement results before and after doing work on the computer for four hours\(^1\). For more details can be seen table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>R&lt;sub&gt;p&lt;/sub&gt;</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in muscle contraction ability /handgrip(kg)</td>
<td>-4.33</td>
<td>2.15</td>
<td>-11.00</td>
<td>0.00</td>
<td>0.667</td>
<td>0.000</td>
</tr>
<tr>
<td>Change in lactic acid Level (mmol/L)</td>
<td>0.51</td>
<td>0.31</td>
<td>0.11</td>
<td>1.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Spearman test results on the relationship of muscle contraction ability change (handgrip) with changes in blood plasma lactate acid levels before and after work for four hours on the computer showed a relationship with significant value 0.000 <0.05, where the change in the ability of contraction of the muscles of the finger and forearm operator computer at -4.33 \(\pm\) 2.15 kg with the lowest change -11.00 kg and the highest 0.00 kg. Changes in blood plasma lactic acid level of 0.51 \(\pm\) 0.31 mmol / L with the lowest change of 0.11 mmol / L and the highest 1.50 mmol / L. If muscle fatigue occurs, the handgrip examination will show a decrease in the
ability of muscle contraction, whereas in the lactic acid level of blood plasma is increased.

The results of the analysis concluded that there is a correlation between the change of muscle contraction ability with the change of lactic acid level of blood plasma of computer operator, meaning the higher the decreasing ability of muscle contraction, the higher the lactic acid blood plasma level increase in fatigue of finger muscle and forearm of computer operator. Muscle fatigue occurs, then the handgrip show the decreased ability of muscle contraction, while the lactic acid level of blood plasma is increased. It is recommended that the measurement of muscle fatigue rate quickly, simple and cheap in the field can be used handgrip method and lactic acid blood plasma level. But both methods can not know whether the muscle fatigue as a result of local or general muscle fatigue.

**DISCUSSION**

This study presents an effective method used in the field in determining muscle fatigue of the forearm of the computer operator after work. The handgrip method is used for the reason that grip strength is an indicator of muscle strength as a parameter that is easily measured. Strength grip with handgrip as one of the characteristics of the sensation of fatigue. The handgrip method is used as a parameter, since the use of handgrip may indicate a decrease in the ability of muscle contraction as a sign of fatigue, as a result of decreased blood supply to the muscle associated with decreased muscle electrical activity. Muscle fatigue occurs as a result of reducing the coupling of excitation contractions caused by the decreased number of active cross bridges due to decreased release of Ca$^{2+}$, decreased myofilament sensitivity in Ca$^{2+}$ and reduced strength produced by a cross bridge. The handgrip method can measure the ability of muscle contraction throughout the range of motion of the joints because the mechanism occurs because of the long relationship of muscle tension, arm and activity moment and muscle mass. Lactic acid method of blood plasma is done to determine the relationship of muscle fatigue with chemical changes in the blood. The mechanism of increased lactic acid levels after work can occur because the work causes the muscles to contract continuously both statically and dynamically to the load given. The continuous contraction in the muscle causes a reduced muscle response which is shown in progressively decreasing the motor unit’s potential amplitude, resulting in a gradual decrease in the strength capacity produced by the neuromuscular system. This is due to a combination of factors, i.e., interference with the mechanism of muscle contraction due to decreased energy storage, obstacles to the influence of the central nervous system and decreased impulse conduction in the myoneural distortion, especially in fast fibers. There is a relationship between decreased strength or fatigue with decreased ATP, increased inorganic phosphate (Pi), increased ADP and PCr depletion which in turn increases the accumulation of lactic acid in the blood. Maximum exercise voluntarily increases lactate concentration as a parameter of fatigue as evidenced by measurement results using a rating of perceived exertion (RPE). Blood lactate concentration reflects the anaerobic capacity of the muscle, lactate or H$^+$ ion is a potential factor causing fatigue. Muscle fatigue can occur through the process of the phosphagen system and anaerobic glycolysis, where the phosphagen system can only provide energy with a short span of time, so anaerobic glycolysis becomes the main metabolic pathway that eventually produces lactic acid. Thus muscle contraction due to computer work can lead to decreased ability of muscle contraction and increase lactic acid blood plasma level. This means there is a relationship between changes in muscle contraction strength with changes in lactic acid levels of blood plasma in computer operator after working on the computer. Handgrip method and lactic acid levels can be used to assess the fatigue that occurs in the forearm muscles of computer operators after doing work on the computer.

**CONCLUSION**

This research has recommended a simple, fast and cheap method of measuring muscle fatigue that can be done in the field without reducing the accuracy of the measurements. This method can be used one or a combination of both to see muscle fatigue after work. These findings are expected to contribute positively to improve the quality of field measurements that require fast, simple and inexpensive measurement results and can be developed on other types of conditions and workers.

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Ethical Clearance: The certificate of ethical clearance is taken from the Ethics Committee of “Airlangga University” with number “481-KEPK”.

REFERENCES


Knowledge of Antenatal Mothers Admitted in King Abdul-Aziz Medical City (KAMC), Riyadh Regarding Therapeutic Benefits of Post-Natal Exercises

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ABSTRACT

The physiological changes that happen during pregnancy and after delivery may affect every mother’s quality of life. They may face chronic back pain and incontinence issues due to negligence of postnatal exercises. Though a large volume of scientific evidence suggests that postnatal exercises are beneficial for preventing disorders and dysfunctions, we were interested in investigating the present level of knowledge regarding the therapeutic benefits of postnatal exercises among antenatal mothers. A quantitative descriptive cross-sectional prospective hospital-based study was carried out among 62 antenatal mothers by handing out a structured postnatal exercise knowledge assessment questionnaire. The result showed that majority of mothers who were admitted at King Abdul-Aziz Medical City in their third trimester had knowledge regarding postnatal exercises representing (70.53%) of the total participants, whereas only (29.47 %) of mothers were unaware of the benefits of postnatal exercises. However the mothers who had knowledge about the benefits of postnatal exercises were not all at the same level of awareness, which means that there were variations among their responses in each item of the questionnaire. It is evident from this study that higher number of antenatal mothers, who were admitted in King Abdul-Aziz Medical City in their third trimester, had knowledge regarding benefits of postnatal exercises.

Keywords: antenatal mothers, postnatal exercises, King Abdul-Aziz Medical City.

INTRODUCTION AND BACKGROUND

Motherhood would help a woman achieve physical and mental self-realization. No other achievement in her life would have such a profound effect on the body, mind and societal aspects of her life¹. The physiological changes along with the musculoskeletal alterations that happen during pregnancy and throughout postpartum leads to joint laxity in the anterior and longitudinal ligaments of the lumbar spine, widening and increased mobility of the sacroiliac joints, pubic syphilis and pelvic bones results in back pain which may affect the mother’s quality of life². Hence the choice of rest with no activities may again cause the mothers to face chronic back pain and incontinence issues. Postnatal exercises are important to improve women’s health after delivery and help to prevent problems such as pelvic floor dysfunction, shoulder pain, back pain, and muscular disorders³. Previous research overwhelmingly suggests the benefits of postnatal exercises, which include improved fitness, decreased body fat, decreased risk of colon cancer, and minimizing the possibility of hypertension⁴. Women, who did postnatal exercises showed improvement in mental health, were less depressed, and anxiety was less common among them⁵. Exercises are important in the postnatal period to lose weight and return to ideal body weight as long-term weight gain can lead to many lifestyle disorders such as obesity, heart diseases, and diabetes⁶.

Earlier studies indicate that ignorance of postnatal exercises deprived women of its benefits and found
that there were changes in postnatal exercise patterns based on demography of the women participants. It was also observed that majority of the mothers have moderate knowledge about postnatal exercise and they were poorly performed. Previous studies also revealed that even though postnatal exercise is advised as part of perinatal care, very fewer percentages of the women have the habit of doing it regularly. Exercise program is one of the effective interventions to prevent lumbo-pelvic pain (LPP) following delivery. Manual therapy is one of the most effective interventions to prevent from pregnancy related back and pelvic pain.

Studies regarding knowledge about postpartum exercise among Saudi nursing mothers conducted in the well-baby and obstetrics clinics of King Abdulaziz University Hospital, Jeddah concluded that women had adequate knowledge about postpartum exercise. Women knowledge was significantly related to their age, income and parity. In addition, women obtained their information about postpartum exercises from different sources such as social media and internet as primary source of knowledge, books, family and friends, while not mentioned the healthcare as source of information. However the awareness of such knowledge among antenatal mothers needed to be evaluated among those who were admitted in King Abdulaziz Medical City, National Guard Health Affairs Riyadh, Saudi Arabia.

MATERIALS AND METHOD

A quantitative, descriptive, cross-sectional, prospective, hospital-based study was carried out among the antenatal mothers in the inpatient unit of King Abdulaziz Medical City hospital. With a population of 73 antenatal mothers visiting King Abdulaziz Medical City, 5% Margin of error and 95% confidence level, the sample size was calculated to 62. The inclusion criteria were antenatal mothers who were admitted in King Abdulaziz Medical City hospital posted for delivery, mothers in the third trimester, and those who were willing to participate. The exclusion criteria involved antenatal mothers who had complications during their pregnancy, outpatient mothers in their third trimester. The consecutive sampling technique was used and mothers were invited to participate in the study by explaining the objectives and obtaining informed consent. Data were collected by handing out a structured postnatal exercise knowledge assessment questionnaire. The questionnaire was formulated in English language then translated to Arabic by a certified translation professionals and validity of the questioner was established by native Arabic language speaking experts in the various fields of medical sciences. There were 19 items divided into two parts. The first part was about the demographic data (8 items) and the second part had questions which assessed the knowledge of postnatal exercise (11 items).

RESULTS

The result of total responses showed that majority of mothers who were admitted at King Abdul-Aziz Medical City in their third trimester had knowledge regarding postnatal exercises representing 70.53% of the total participants, whereas only 29.47% of total mothers were unaware of the benefits of postnatal exercises. The mothers who had positive response on the benefits of postnatal exercises questionnaire were not at the same level of awareness, which means that there were variations among them in each item of the questionnaire. Frequency and percentage of each item is demonstrated in the questioner. Item A in the questionnaire was the only element that showed higher negative responses among the mothers confirming that most of the participants had not received postnatal exercises before. On the other hand, the other items showed significantly positive responses and they obviously explained that the knowledge regarding the benefits of postnatal exercises among the antenatal mothers was higher than unfamiliarity. In (Item A), there were 12 mothers who had received postnatal exercises before and that were representing 19.4% of total percent. However, the antenatal mothers who had not received postnatal exercises were 50, which representing 80.6% of the total sample.

For (Item B), the number of participants who knew that postnatal exercises decrease tiredness and increase the sense of wellbeing was 52, which made 83.9% of the total participants nevertheless, the number of antenatal mothers who didn’t know about such benefits were representing 16.1%. Regarding (Item C), 49 antenatal mothers had knowledge about the returns of postnatal exercises in losing weight that represent 79%, but those who had no information were 13 which is equivalent to 21% of the total. We found out that the antenatal mothers who knew about the benefits of postnatal exercises in improving cardiovascular fitness were 40 mothers representing 64.5% of the total percent. However, the mothers who didn’t know were 22
representing 35.5% as elicited by (Item D). (Item E) was about the knowledge concerning postnatal exercises in improving the mood and gain in preventing postpartum depression, 41 mothers, which translates to 66.1% of total percent were aware, but the mothers who didn’t recognize the benefits were 21 representing 33.9%. The greatest knowledge among antenatal mothers was score for (Item F) which was about benefits in improving the condition of abdomen muscles and they were 55 mothers who knew about it, 88.7% of the total sample in contrast 7 mothers didn’t know the effects on abdominal strengthening, 11.3%. In (Item G), the mothers who had information about the benefits of postnatal exercises in healing the pregnant body by getting rid of aches and pains were 46 participants, 74.2% of total participants, but mothers who had no information were 16, 25.8%. The number of antenatal mothers who knew that postnatal exercises prevents the body from fatigue by improving endurance level, and help the mother to take charge during motherhood were 42 women i.e. 67.7% , however, mothers who didn’t know about it were 20 participants representing 32.3% (Item H). We found out that knowledge of antenatal mothers about the benefits of postnatal exercises in increasing body flexibility were 50 women representing 80.6% of total sample yet, the antenatal mothers who had no information were 12 representing 19.4% of the total percent in (Item I). 43 mothers representing 69.4% of the total percent knew about the benefits of postnatal exercises in strengthening pelvic muscles as shown in (Item J). Still, 19 mothers representing 30.6% didn’t know. Finally, in (Item K) the number of antenatal mothers who knew that postnatal exercises helps in restoring muscles strength and firm up the body was 51 women, which means that 82.3% of the total sample whereas the number of antenatal mothers who didn’t know was 11, i.e. equivalent to 17.7% of the total responses.

CONCLUSION

This study finding suggests that a large number of antenatal mothers in the third trimester admitted in King Abdul-Aziz Medical City, Riyadh had knowledge regarding benefits of postnatal exercises. Another study conducted in Saudi Arabia also concluded that women had sufficient knowledge regarding postpartum exercises[11]. Study results among pregnant and nursing mothers in Nigeria indicated that participation in antenatal and postnatal exercise was dependent on self-prescription as well as level of education[12]. The same investigators also found out that majority of Nigerian pregnant women demonstrated inadequate knowledge but had positive attitude towards antenatal exercises, knowledge about benefits and contraindications to antenatal exercises significantly influenced the attitude towards exercise in pregnancy[13]. A large number of Indian pregnant women demonstrated inadequate awareness but were optimistic towards exercises in pregnancy[14]. Different types of awareness program are required to improve maternal knowledge on postnatal care which includes in areas of lack of knowledge among mothers regarding postnatal period, postnatal exercise, timing of first bath after birth of baby[15]. Though the results of our study suggests that mothers had adequate knowledge regarding postnatal exercise to determine the level of knowledge of mothers throughout Saudi Arabia, a larger sample size and multi settings study needs to be undertaken.

Conflict of Interest- The authors have no conflict of interest to disclose.

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Ethical Clearance- The Institutional review board of the King Abdullah International Medical Research Center (IRB-KAIMRC) approved the study with the protocol number SP17/202/R. An informed consent was obtained from all the participants in the study.

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The Effect of Physical Activity (Endurance and Strength) and Sleep Management on BMI and Body Fat Children Overweight in Makassar City

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ABSTRACT

Obesity of school children was 18.8% reached higher than to children under five, recent studies showed that obesity made effect to sleep management. This study aims to at analysis the effect of physical activity and sleep management on BMI for age and body fat percentage in overweight school children in Makassar City.

A quasi-experimental design was conducted in two-schools at SDN Kompleks IKIP and IKIP 1 Makassar in January to May 2018. Total 42 samples have been selected purposive. Samples were divided into three groups, sleep management (SM), sleep management combination of physical activity (CP), and control (CT). Each group consists of 14 students. At baseline, there were no significant differences in nutritional intake, BMI, body fat percentage, and sleep quality of the three groups. Overall, after the intervention, BMI for age and body fat percentage no significant difference between groups SM, CP and CT. Significant differences in all groups were control variables, significant sleep quality (p=0.000 ), protein (p=0.008 ), fat (p=0.008 ) and carbohydrate (p=0.000). Furthermore, the analysis of each group there was the tendency of significant differences. The CP group significantly decreased to BMI for age 0.21 SD (p=0.027), fat 8.36% (p = 0.008), carbohydrate 22.29% (p=0.000), and increased to protein -30.50% (p=0.001). There was no effect of sleep management and sleep management combination of physical activity on BMI for age and body fat percentage. However, there was tendency to decreased BMI for age, nutritional intake and improve sleep quality. It takes discipline to the management of sleep and longer intervention period and sustainability.

Keywords: Physical Activity, Sleep Management, BMI for Age, Body Fat, Overweight

INTRODUCTION

Based on WHO data, 50 million girls and 74 million boys was obesity in the world1. Asia-Pacific represents the largest number of obesity region, including Indonesia. The prevalence of obesity increased by almost 40%2. Obesity of school children was 18.8% reached higher than to children under five1. Overweight children were four times as likely to become obese as adults, predictor of obesity and other metabolic risk factors in adulthood, a risk of various chronic diseases and a serious impact on the health and development of child psychology3,4. Unhealthy lifestyles and diets, including sedentary activity, screen time, low levels of physical activity, inadequate sleep may contribute to the risk of obesity5. Children were at the lowest level of physical activity, spending 50% of time for sedentary activity, 6.7% meeting physical activity7. Low levels of physical activity in children were associated with short and long-term psychological and physiological health consequences8. IOM physical activity guidelines recommend that school-aged children engage in 180 minutes of mild, moderate and severe physical activity9. Recommended for more moderate to vigorous-intensity physical activity10. Intervention in obesity prevention in school and family-based diet and physical activity that in children aged 5-7 years showed no difference in body fat percentage in girls and boys11. The recent studies showed that obesity made effect to sleep management. The meta-analysis of 700,000 child data studies from 20 countries, the average child was currently sleeping less 20-25
minutes each day than their parents at his age\textsuperscript{12}. Several studies have reported an association between short sleep duration and health problems, including association with death, type 2 diabetes, hypertension, metabolic syndrome, respiratory illness, obesity in children and adults, and poor self-health\textsuperscript{13}. Short sleep duration and poor sleep quality are significantly associated with obesity\textsuperscript{14}. Less sleep (2-4 hours a day) can result in 18% loss of leptin and 28% increase in ghrelin, which can lead to increased appetite by 23-24%, resulting in a lack of physical activity followed by an increase in caloric intake\textsuperscript{15}. The prevalence of sleep disturbance in children with obesity of 66.7% and sleep management affects the quality of sleep reached 85\%\textsuperscript{16}. NSF recommended of sleep duration of 6-13 year old school children take 9-11 hours\textsuperscript{17}. But reportedly for school-aged children were not yet recommended, children more interested and spend more time for sedentary activity and caffeine products, all of which can cause sleeplessness, nightmares and sleep disturbance\textsuperscript{18}. In relation to this matter, this research important to study about the effect of physical activity and sleep management on BMI for age and body fat percentage in overweight school children in Makassar City.

\textbf{MATERIAL AND METHODS} A quasi-experimental design was conducted in two-schools at SDN Kompleks IKIP and IKIP 1 Makassar in January to May 2018. Schools were selected purposively, had been willing to cooperate and had not received similar interventions, had the same demographic characteristics, number of students, family socioeconomic status and school environment. Subjects involved in the study were 42 students that meet the inclusion and exclusion criteria. The inclusion criteria in this study subject were 5th graders (Age 10-11) in SDN Kompleks IKIP and IKIP 1, Muslim, had been screened overweight, willing to be given intervention, approved and supported by guardian throw to inform consent. Exclusion criteria were the subject does not experience pain or injury, taking certain medications that can result in the respondent had difficulty sleeping within 1 month before data collection.

Each group consists of 14 students. Endurance of running in place, jumping jacks, squats, jumping lunges. Strength of mt. climbers, plank jacks, and push ups. Sleep management in the form of sleep hygiene, DMT (prayer before bedtime), sleep quality and how to maintain a child’s weight. The media have used parent pocket books and power points for samples. Group SM intervention in the form of sleep management is given once a week indoors for 60 minutes, 10 meetings as extracurricular subjects. CP interventions in the form of a combination of sleep management and physical activity was given for four times a week, one indoor and three outdoor times. Outdoor interventions were given physical activity for 20 minutes before entering the classroom or after school, 30 meetings. CT as a control group gets subjects of physical education by school teachers once a week. Interventions directly by researcher, assisted by enumerators and controlled by sports coaches.

Primary data were obtained through anthropometry measurement, direct interview and questionnaire, before intervention (I) and three months after intervention (II). Secondary data is obtained from school archives. Anthropometric measurements that include weight measurement using digital scales, for measurement of height using microtoise, and body fat measurement using Biometrical Impedance Analysis (BIA). Sleep quality is measured using the PSQI questionnaire. Nutrient intake was measured using SQ-FFQ.

\textbf{RESULTS}

\begin{table}
\centering
\begin{tabular}{|l|l|l|l|l|l|}
\hline
\textbf{Nutritional Intake} & \textbf{Time} & \textbf{Group} & \textbf{SM (n=14)} & \textbf{CP (n=14)} & \textbf{CT (n=14)} & \textbf{Total (n=42)} & \textbf{p\textsuperscript{p}} \\
\hline
\multirow{4}{*}{\textbf{Energy (\%)} } & Before & 108.21 ± 6.32 & 103.93 ± 8.14 & 102.71 ± 9.98 & 107.29 ± 8.79 & 0.062 \\
\cline{2-7}
\cline{2-7}
 & \textbf{∆} & 2.07 ± 5.75 & 5.00 ± 9.66 & 0.79 ± 4.91 & 52.38 ± 146.90 & 0.110 \\
\cline{2-7}
 & \textbf{p\textsuperscript{p}} & 0.201 & 0.075 & 0.560 & 0.560 & 0.560 \\
\hline
\end{tabular}
\caption{The Effect of Intervention on Nutritional Intake}
\end{table}
The results of the nutritional intake analysis showed that the baseline and after intervention were no significant in all groups. However, the results test of each group significant in the CP group, increased nutritional intake protein -30.50% (p=0.001) and decreased fat 8.36% (p=0.008) and carbohydrates 22.29% (p=0.000) (Table 2).

**Table 2: The effect of intervention on BMI for age, body fat percentage, and sleep quality**

<table>
<thead>
<tr>
<th>Effect of Intervention</th>
<th>Group</th>
<th>Total (n=42)</th>
<th>p²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SM (n=14)</td>
<td>CP (n=14)</td>
<td>CT (n=14)</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td><strong>BMI (SD)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>1.64 ± 0.35</td>
<td>1.57 ± 0.24</td>
<td>1.54 ± 0.33</td>
</tr>
<tr>
<td>After</td>
<td>1.48 ± 0.47</td>
<td>1.36 ± 0.35</td>
<td>1.47 ± 0.40</td>
</tr>
<tr>
<td>Δ Mean ± SD</td>
<td>0.15 ± 0.33</td>
<td>0.21 ± 0.31</td>
<td>0.06 ± 0.18</td>
</tr>
<tr>
<td>p²)</td>
<td>0.102</td>
<td>0.027*</td>
<td>0.174</td>
</tr>
<tr>
<td><strong>Body Fat Percentage (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>21.45 ± 4.46</td>
<td>20.69 ± 3.70</td>
<td>19.80 ± 3.59</td>
</tr>
<tr>
<td>After</td>
<td>21.44 ± 4.51</td>
<td>20.16 ± 3.82</td>
<td>19.86 ± 4.18</td>
</tr>
<tr>
<td>Δ Mean ± SD</td>
<td>0.01 ± 1.00</td>
<td>0.52 ± 1.03</td>
<td>-0.06 ± 1.13</td>
</tr>
<tr>
<td>p²)</td>
<td>0.958</td>
<td>0.079</td>
<td>0.835</td>
</tr>
<tr>
<td><strong>Sleep Quality (Score)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>8.36 ± 3.22</td>
<td>7.14 ± 1.87</td>
<td>8.5 ± 3.73</td>
</tr>
<tr>
<td>After</td>
<td>3.86 ± 1.95</td>
<td>3.71 ± 1.06</td>
<td>7.43 ± 3.03</td>
</tr>
<tr>
<td>Δ Mean ± SD</td>
<td>4.50 ± 1.50</td>
<td>3.43 ± 0.93</td>
<td>1.07 ± 1.14</td>
</tr>
<tr>
<td>p²)</td>
<td>0.000*</td>
<td>0.000*</td>
<td>0.004*</td>
</tr>
</tbody>
</table>

*p<0.05*
The results of the analysis show that baseline was generally no significant in all groups. Furthermore, after the intervention, BMI for age and body fat percentage no significant difference between groups SM, CP and CT. Significant differences in all groups were control variables, significant sleep quality (p=0.000). The test results of each group significant in the CP group. CP group there was a significant difference in the decreased of BMI for age of 0.21 SD (p = 0.027).

**DISCUSSION**

This study found that after intervention in the form of sleep management, BMI for age and body fat percentage of the subject there was no significant difference between group SM, CP and CT. However, the analysis of each group there was tendency towards decrease in BMI for age. Significant differences in the sleep quality, protein, fat and carbohydrate as control variables. The results of this analysis indicate that sleep management interventions and sleep management combinations with physical activity over a period of 3 months were not sufficient to decrease BMI and body fat percentage. But it has influenced sleep behaviour and subject food consumption patterns. A study in Australia showed that structured sleep intervention and sleep hygiene within 12 weeks had no effect on BMI, but were related to sleep behaviour and sleep quality.

Evaluation of the implementation of sleep management intervention has not been implemented optimally as expected. There were still some items in sleep management that sometimes do not work, such as the limits of television use, smart phone and subject bedtime, because it is less disciplined and less controlled by parents. The CP group experienced significant changes supported by a combination of physical activity in schools. This is supported by a study physical activity intervention 3 times a week within 8 weeks managed to reduce 0.6 SD in obese children. Children who experience moderate fatigue usually get a good night’s sleep, especially when fatigue is obtained from physical exercise. Moderate to vigorous-intensity activities can make sleep more soundly, increase the amount of sleep time, and reduce awakening during sleep.

The study also found that after intervention there was no significant difference in body fat percentage, estimated that children were still doing sedentary activities, consuming energy-dense foods and sugary drinks contribute to fat accumulation in children. The survey results that children were at the lowest level of physical activity, spend 50% of the time sedentary activity and only 6.7% meet physical activity. The impact on these risk factors was moderated by factors such as age, sex, residence status, parenting, and lifestyle. Intake of nutrients after intervention intake of protein nutrients increased significantly CP group. Some research results indicate that a high-protein diet proves effective against weight gain prevention and for weight loss in overweight children.

**CONCLUSION**

There was no effect of sleep management and sleep management combination of physical activity on BMI for age and body fat percentage. However, there was tendency to decreased BMI for age, nutritional intake and improve sleep quality. It takes discipline to the management of sleep and longer intervention period and sustainability.

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**Conflict of Interest:** All authors declared no conflict of interest within this study.

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Occupational Health and Safety Risk Assessment in Chrome Production

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ABSTRACT

Background. In the Republic of Kazakhstan, there are large deposits of chromium. Thus, its production is an important part of country’s industry. The job at such enterprises is connected with a certain health risk. The purpose of the study is to assess the physical condition of workers from Aktobe Chromium Compound Plant and to identify carcinogenic and other risks.

Methods. We have collected air samples and certain data on workers’ physical condition from different departments at the plant to calculate indicators for assessing health risk for the population near production sites and for the workers.

Results. We have studied the level and structure of morbidity rates with temporary disability among workers of essential trades from Aktobe Chromium Compound Plant. We have determined the Spearman’s rank correlation coefficient to assess the relationship between the air content (chromium compounds) at production sites and the morbidity rates (nosological forms).

Conclusion. The study of chrome pollution levels in production departments revealed departments with the highest pollution level. Occupational health and safety risk assessment allowed assessing the relation between working conditions of workers’ physical condition objectively.

Keywords: production risk; chromium; disability; pollution level; air pollution

INTRODUCTION

There is one of the world’s largest chromite ore deposits on the territory of Aktobe region¹. There are large ferrochrome alloy and chromium compound plants. At present, the mining industry employs the majority of the working population – about 300 thousand people.

Chromium accumulates in tissues and blood². The workers in contact with chromium compounds often have functional changes in physiological systems of the body, which in turn contribute to the risk of general and professional-related diseases. It adversely affects the skin, can cause lung cancer, including adenoidal cystic and osteogenic carcinoma, cardiovascular diseases, and gastric cancer. Comprehensive studies that were conducted in Central Europe found that the accumulation of heavy metals could cause renal cell carcinoma³,¹⁴-¹⁷.

Risk assessment is a probability determination of serious injury by identifying indicators related to safety and their quantitative assessment based on empirical data collected in the course of research activities. The priority of preventive measures at the design stage is an important principle⁴.

Chrome compounds penetrate the body through the respiratory tract and mucous membranes and intact skin of the workers. The indicators of chromium status in
human organism are its concentration in blood (26.6 - 31 mcg/l) and urine (7.9 - 9.8 mcg/l). The workers related to mono- and dichromate production are under higher risk.

The purpose of this study was to assess the air in industrial facilities and investigate the incidence rate among workers, with a view to determining the correlation between these two indices.

METHOD

The assessment of air samples that were taken from production facilities of the Aktobe Chromium Compound Plant (ACCP) was conducted in 2012-2014. Two main parameters were studied – air pollution by chromium-containing aerosols in production facilities, calculated as CrO3, and concentration of suspended materials in production facilities. The assessment of production environment factors was carried out by means of air aspirators M 822 and AM-5M (Labtekh, Russia) for air sampling. The devices were calibrated as of the moment of sampling.

Data collection and analysis on health indicators was conducted in accordance with the recommendations of Alpysbaeva Z. T. At that, we took into account the age, length of service, professional group, and sex of workers, as well as the standardized intensive indices of incidence rates by age, length of service, professional group, and sex, respectively. To determine the combined effect of environmental factors on the risk level of professional use of modern appropriate methods of assessment. To assess the degree of association of the disease with the work necessary to analyze a pile conditions, a comprehensive assessment of the health of employees as well as expect the relative risk and etiologic fraction of “contribution” of production factors in disease development.

Health Risk Assessment was carried out according to “Methodology Guidelines for Assessing Human Risk from Chemical Hazards”, provided by Nemenko B.A.6

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Calculation formula and symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odds ratio</td>
<td>OR = a:b/c:d=ad/(bc), Where: a – exposed worker with disease; b – not exposed worker with disease; c – exposed worker without any disease; d – not exposed worker without any disease</td>
</tr>
<tr>
<td>Absolute risk or attributable risk (AR)</td>
<td>AR= p₁ - p₀, Where: p₁ – morbidity rate in production departments; p₀ – morbidity rate in service departments; The absolute risk as a percentage is referred to as the attribute risk, and is calculated according to the formula: AR% = (p₁ - p₀)/ p₁ *100%</td>
</tr>
<tr>
<td>Lifetime average daily dose of penetrating compound</td>
<td>LADD=(LC<em>CR</em>ED<em>EF)/(BW</em>AT*250), Where: LC – concentration (mg/m³, mg/l); CR – penetration rate (m³/day, l/day); ED – exposure duration (experience rate); EF – exposure frequency (250 days); BW – body weight (kg); AT – time period over which the dose is averaged (days); 250 – working days in a tear;</td>
</tr>
<tr>
<td>Individual carcinogenic risk (ICR)</td>
<td>ICR = CDI / SF, Where: CDI – chronic daily intake; SF – carcinogen slope factor</td>
</tr>
<tr>
<td>Population carcinogenic risk (PCR)</td>
<td>PCR = ICR × number of workers;</td>
</tr>
<tr>
<td>Hazard quotient</td>
<td>HQ=Cactual/RfC, C – actual air concentration μg/m³; RfC – reference concentration, μg/m³.</td>
</tr>
</tbody>
</table>

We determined the Spearman rank correlation coefficient to assess the relationship between the air content (chromium compounds) at production sites and the morbidity rates (nosological forms).

RESULTS

Air sample analysis, taken from production departments of Aktobe Chromium Compound Plant.

The investigation of the air pollution level in various departments of the compound plant found that the
concentration of dust in all facilities exceeded the norm significantly. Departments 4 and 5 had the relatively lowest concentration of dust in the air when compared to other departments. The pollution level in department 1 exceeded the norm significantly, making it the most polluted department, according to the obtained data (Table 2).

Table 2: Air pollution by chromium-containing aerosols, calculated as CrO₃, and suspended materials concentration in production departments

<table>
<thead>
<tr>
<th>Department</th>
<th>Average air pollution level</th>
<th>AAQS</th>
<th>Dust level</th>
<th>AAQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMP-1, Department</td>
<td>0.014 mg/m³ – 0.016 mg/m³</td>
<td>0.01 mg/m³</td>
<td>1.17 mg/m³ – 1.77 mg/m³</td>
<td>4.0 mg/m³</td>
</tr>
<tr>
<td>SMP-2, Department</td>
<td>0.020 mg/m³ – 0.022 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.98 mg/m³ – 1.09 mg/m³</td>
<td>4.0 mg/m³</td>
</tr>
<tr>
<td>Department 3</td>
<td>0.007 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.85 mg/m³ – 1.44 mg/m³</td>
<td>4.0 mg/m³</td>
</tr>
<tr>
<td>Department 4</td>
<td>0.008 mg/m³ – 0.010 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.85 mg/m³ – 1.19 mg/m³</td>
<td>4.0 mg/m³</td>
</tr>
<tr>
<td>Department 5</td>
<td>0.008 mg/m³ – 0.010 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.63 mg/m³ – 1.63 mg/m³</td>
<td>4.0 mg/m³</td>
</tr>
</tbody>
</table>

The maximum air pollution rate by chromium was found in roasting and filtration department and in wet-grinding mill designed for sodium monochrome production: SMP-1 in Department 2 (AAQS: 2.1 – 3.0) and SMP-2 in Department 2 (AAQS: 2.9 – 3.0), respectively. Therefore, the assumption is that the workers of these facilities will have a higher incidence rate when compared to those of other facilities with a lower pollution level.

Health status of workers in production departments of Aktobe Chromium Compound Plant. Health status assessment revealed that the most common diseases among the workers are acute respiratory disease (ARD), musculoskeletal system diseases, problems with digestive tract and inflammatory skin diseases.

The study showed that the dominating diseases were respiratory diseases, which is explained by the high level of air pollution in the working environment. The second-most common diseases were gastrointestinal and skin diseases, which confirms the negative impact of chromium compounds, especially those of hexavalent chromium, on chrome production facility workers. It is worth noting the high incidence of acute respiratory diseases (ARD) among the workers, which is explained by the high general level of respiratory diseases. The results are shown in Figure 1.

Figure 1. Spearman’s rank correlation coefficient
According to these data, there is a strong correlation between occupational hexavalent chromium exposure and respiratory diseases and diseases of digestive system in all departments – the r ratio was, respectively, in the range from 0.8 to 0.97 (under $p < 0.05$) and in the range from 0.73 to 0.8 (under $p < 0.05$). The average correlation was determined for the following diseases: ARD (from $r = 0.3$ up to $r = 0.5$ under $p < 0.05$); musculoskeletal system diseases (from $r = 0.33$ to 0.52 under $p < 0.05$); inflammatory skin diseases (from $r = 0.25$ to $r = 0.5$ under $p < 0.05$).

We calculated the average daily dose of penetrated hexavalent chromium. The largest average daily dose of penetrated hexavalent chromium was discovered in departments 1 and 5, which is explained by a high level of pollution of the working environment therein. This allows concluding that the concentration of carcinogenic hexavalent chromium in the air of the department exceeds the norm (Figure 2).

We have determined that the priority diseases among workers of ACCP related to production pollution are diseases of digestive system. In particular, the workers engaged in SMP-2, SMP-1 in Department 2 are under a high risk of gastric ulcer and duodenitis; the second place – Department 4.

**DISCUSSION**

Heavy industry job affects the musculoskeletal system, namely, it results in back pain, which will be chronic.

The diastolic hypertension was found in about 20% of steel industry workers; the basic amount of workers (80%) have problems with fatness or overweight.

Hexavalent chromium is carcinogenic and provokes lung or liver cancer of male workers. High chromium status in the body was found in female workers. In consequence, there was a decrease in fertility in addition to certain problems with lungs and liver.

Chrome production has a detrimental effect on the human respiratory system. Miners are the most vulnerable, as they get the largest amount of chromium in the form of dust that settles in the lungs. In consequence, there will be cancer formation due to chromium compound exposure with lungs.

Mortality studies in chrome production workers showed that workers are in the middle of malignant
tumor formation in the lungs, intestinal tract, breast and prostate. Diabetes and Alzheimer’s disease are also common disease causes. We also have certain data on stomach cancer, caused by high chromium status.

Sewage water contains chromium. Inadequate wastewater depuration leads to a significant metal water pollution. In this case, chromium accumulates in the tissues and in agricultural plants. Soil irrigation with wastewater containing chromium results in its accumulation in vegetables, grown for human consumption. Our data point to the great influence of the environment on workers’ health status. These workers are in a group of potential medical problem owners in terms of digestive and respiratory diseases.

Data, obtained by our foreign colleagues and us, allows us to speak about a certain risk level in chrome production and processing. Accordingly, in our opinion, the engagement in chrome production should be clearly limited in time in a greater extent than the engagement in activities at other enterprises with eight-hour day. The workers shall be provided with a special protective clothes; everyone, who has access to chromium dust, should wear respirators and undergo medical check-ups that are more frequent. The personnel shall be

CONCLUSION

In monitoring hexavalent chromium-containing aerosol dynamics in workplace air, we have found that roasting and filtration department and wet-grinding mill designed for sodium monochrome production: SMP-1 in Department 2 (AAQS: 2.1 – 3.0) and SMP-2 in Department 2 (AAQS: 2.9 – 3.0) respectively are areas with the highest concentration of hexavalent chromium-containing aerosols.

Morbidity analysis with temporary disability has showed the dominating diseases: acute respiratory diseases, musculoskeletal system diseases, skin diseases and digestive system diseases. The highest morbidity rate was found in relation to workers engaged in SMP-1 in Department 2.

Correlation degree assessment between hexavalent chromium concentration in workplace air and the priority nosological forms has showed a significant dependence of respiratory diseases ($r=0.45\pm0.01$ – $r=0.5\pm0.02$). The comprehensive risk assessment of production chromium pollution has shown the high risks in SMP-2 and SMP-1 in Department 2.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Statement of Informed consent: All patients were informed of the study and agreed to process the results.

Statement of Human Rights: The rights of all patients have been complied with in accordance with the Helsinki Declaration of 1975, and with the amendments 2000.

REFERENCES


Food Stalls Ownership and Its Contribution on Body Mass Index and the Risk of Cardiovascular Disease in Cooker Profession

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Faculty of Public Health, Hasanuddin University

ABSTRACT

The importance of identifying cardiovascular disease risk factors can provide a major contribution to the prevention strategy for cardiovascular disease. This study was aimed to identify the prevalence of cardiovascular risk associated with the Body Mass Index and the ownership of food stalls. This study was a cross sectional study. A total 80 cookers as samples were determined by purposive sampling. Determination of cardiovascular disease risk using the Cardiovascular Jakarta Score, which is associated with food stalls ownership and body mass index. Data collection were conducted by health workers using questionnaires, measuring body weight and height. Data processing using SPSS version 20 for Windows, and analysis using Chi Square test with alternative Mann-Whitney test, at 95% CI and significant level ρ<0.05. The result of this study, as many as 52.5% of cookers are at high risk of cardiovascular disease. There was a significant relationship between the ownership of food stalls and the risk of cardiovascular disease. There was a tendency for cookers with abnormal Body Mass Index to experience a risk of cardiovascular disease. In conclusion, the ownership of food stalls contributes to an increase in body mass index and risk of cardiovascular disease for cooker in food stalls. Providing knowledge with mentoring methods is needed to control the risk of cardiovascular disease in cooker as informal sector workers.

Keywords: Cardiovascular disease, Body mass index, Ownership of food stalls

INTRODUCTION

Epidemiological transitions caused by industrialization, urbanization and lifestyle changes have resulted in an increase in the number of cardiovascular diseases sufferers¹. Data obtained from WHO, each year the death rate caused by cardiovascular disease (CVD) is 17.7 million people each year or 31% of all global deaths². Cardiovascular disease is now the cause of more than half of the global burden of disease and in Indonesia is expected to continue to increase until 2030 will reach 23.3 million deaths. In addition to causing pain and even death, losses caused by cardiovascular disease will also have an impact on the socio-economic life of the patient’s family, society, and the State³.

A study resulted that the prevalence of heart disease in South Sulawesi Province was 0.8% diagnosed by health workers and 9.4% determined by health workers or symptoms. The prevalence of CHD suspects in South Sulawesi was 0.87% and was included in the moderate category with risk factors based on Jakarta Cardiovascular Score⁴.

All professions have a potential hazard which can reduce the productivity of a worker. Hazard obtained in the workplace can come from the work environment, the tools and materials used, the work process, and also the workers themselves². It can be concluded that work-related occupational accidents and diseases arise can be broadly divided into two causes, namely unsafe behavior and conditions. The largest percentage of causes of work-related occupational accidents and diseases is unsafe behavior reached 80%⁸. Several studies have proven that there is a significant relationship between
work and the incidence of cardiovascular disease in which the causative factors can originate from the work environment, such as noise factors, work stress, or caused by unhealthy lifestyles7-13.

The cooker is one of the professions in informal sector which is at risk of having illness if it is associated with the work process. Research conducted by Bosu found the highest prevalence of hypertension in cookers, amounting to 68.9%14 compare to other professions. Meanwhile, hypertension is one of the most important triggers of cardiovascular disease15. The relationship between work as cooker and the risk of cardiovascular disease, until now is still unclear. However, consumers who always consume ready-to-eat foods have greater risk factors for cardiovascular diseases, namely the Body Mass Index (BMI), waist circumference, cholesterol levels and acid serum concentrations compared to consumers who rarely or low consume fast food so it is recommended to limit these foods especially to people with high cardiovascular risk16. This study aims to determine the prevalence of cardiovascular disease risk associated with BMI and ownership of food stalls.

**MATERIAL AND METHOD**

This research was a cross sectional study, the determination of the sample by purposive sampling by using the proportion a study17. As a result, 80 of cooks were recruited as study participants in the work area of the Community Health Center of Tamalanrea. The study was conducted from March to May 2018 in Makassar City. The location was determined by considering the number of restaurants in the vicinity of densely populated housing and adjacent to the location of educational places. Data collection was carried out by using instruments consisting of the Cardiovascular Jakarta Score questionnaire, the characteristics of respondents, determinants of the body mass index and business ownership factors.

Characteristics of respondents consisted of gender, age (17-25 years; 26-45 years; 46-65 years), married status (married; single); education level (low: ≤ high school; high:> high school) and Tribe. BMI (≥ 18 to <25: normal; ≥25 is not normal)18. Food stall ownership is divided into two categories: as the owners and as a worker in food stall (not the owner).

Determination of cardiovascular disease risk by using Jakarta Cardiovascular score based on gender, age, blood pressure (JNC-VI criteria), smoking, diabetes mellitus, body mass index, and weekly physical activity. The sensitivity and specificity were high (77.9% and 90%, respectively). The positive predictive value was 92.2% and negative predictive value was 72.8% of Framingham study scores, with categories: Low Risk: (Jakarta Score <1), Moderate Risk: (Jakarta Score 2 - 4), High Risk: (Jakarta Score> 5)19. Measurement of body weight, height, blood pressure and diabetes mellitus status were carried out by health workers from the Makassar Regional Health Laboratory. Data processing was performed using SPSS v. 20 for Windows and analyzed using Chi Square test with an alternative Mann-Whitney test, at 95% CI and a significant level ρ<0.05.

**RESULTS**

Table 1 shows that gender, age, and marital status have a relationship with cardiovascular risk (p<0.05). The highest proportion of the cardiovascular risk was male. Likewise, age of 46-65 years and married status, compared to other groups. Although the level of education and ethnicity did not affect the cardiovascular risk, there was a trend of an increased risk of cardiovascular disease in both low and high education levels. In addition, Toraja and Javanese tribe tended to have cardiovascular risk compared to other tribes.
Table 1. Characteristics of Respondents based on Cardiovascular Risk, BMI, and Food Stall Ownership

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Cardiovascular risk</th>
<th>Body mass index</th>
<th>Food stall ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low n=17 Middle n=21 High n= 42</td>
<td>Normal n=32 Malnourished n=48</td>
<td>Owned n=31 Not owned n=49</td>
</tr>
<tr>
<td>Gender</td>
<td>2 (5,9) 8 (23,5) 24(70,6)</td>
<td>14(41,2) 20(58,8) 34(100)</td>
<td>15(44,1) 19(55,9) 34(100)</td>
</tr>
<tr>
<td>Male</td>
<td>15 (32,6) 13(28,3) 18(39,1)</td>
<td>18(39,1) 28(60,9) 46(100)</td>
<td>16(34,8) 30(65,2) 46(100)</td>
</tr>
<tr>
<td>Female</td>
<td>129x680 n=80</td>
<td>129x680 n=80</td>
<td>129x680 n=80</td>
</tr>
<tr>
<td>Age</td>
<td>17 – 25 yo: 6(40,0) 5(33,3) 4(26,7)</td>
<td>15(100) 9(60) 6(40)</td>
<td>15(100) 6(40)</td>
</tr>
<tr>
<td></td>
<td>26 – 45 yo: 11(26,8) 14(34,1) 16(39,0)</td>
<td>41(100) 12(29,3) 29(70,7)</td>
<td>41(100) 19(46,3)</td>
</tr>
<tr>
<td></td>
<td>≤ 46 yo: 0(0) 2(8,3) 22(91,7)</td>
<td>24(100) 11(45,8) 13(54,2)</td>
<td>24(100) 12(50,0)</td>
</tr>
<tr>
<td>Marital status</td>
<td>11(17,7) 14(22,6) 37(59,7)</td>
<td>62(100) 25(40,3) 37(59,7)</td>
<td>62(100) 29(46,8)</td>
</tr>
<tr>
<td>Married</td>
<td>6(33,3) 7(38,9) 5(27,8)</td>
<td>18(100) 7(38,11) 11(61,1)</td>
<td>18(100) 2(11,1)</td>
</tr>
<tr>
<td>Not married</td>
<td>12(22%,) 18(25,7) 36(51,4)</td>
<td>70(100) 28(40) 42(60)</td>
<td>70(100) 26(37,1)</td>
</tr>
<tr>
<td>Education level</td>
<td>16(22,9) 3(30,0) 6(60,0)</td>
<td>10 (100) 4(40) 6 (60)</td>
<td>10(100) 5(50,0)</td>
</tr>
<tr>
<td>Low</td>
<td>4(30,8) 3(23,1) 6(46,2)</td>
<td>13(100) 5(38,5) 8(61,5)</td>
<td>13(100) 4(30,8)</td>
</tr>
<tr>
<td>High</td>
<td>4(15,45) 6(23,1) 16(61,5)</td>
<td>26(100) 11(42,3) 15(57,7)</td>
<td>26(100) 11(42,3)</td>
</tr>
<tr>
<td>Tribe</td>
<td>4(19,0) 8(38,1) 9(42,9)</td>
<td>21(100) 8(38,1) 13(61,9)</td>
<td>21(100) 10(47,6)</td>
</tr>
<tr>
<td>Bugis/Makassar</td>
<td>5(25,0) 4(20,0) 11(55,0)</td>
<td>20(100) 8(40) 12(60)</td>
<td>20(100) 6(30,0)</td>
</tr>
<tr>
<td>Toraja</td>
<td>5(59,1%) 22(71,0%) 31(100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jawa</td>
<td>3(40%) 48(60%) 80(100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0,005</td>
<td>0,853</td>
<td>0,397</td>
</tr>
<tr>
<td></td>
<td>0,000</td>
<td>0,598</td>
<td>0,003</td>
</tr>
<tr>
<td></td>
<td>0,028</td>
<td>1,000</td>
<td>0,006</td>
</tr>
<tr>
<td></td>
<td>0,431</td>
<td>0,965</td>
<td>0,397</td>
</tr>
<tr>
<td></td>
<td>0,853</td>
<td>1,000</td>
<td>0,598</td>
</tr>
<tr>
<td></td>
<td>0,006</td>
<td>1,000</td>
<td>0,965</td>
</tr>
<tr>
<td></td>
<td>0,111</td>
<td>0,003</td>
<td>0,397</td>
</tr>
</tbody>
</table>

Body mass index (BMI) does not show a significant relationship with all characteristics variables. In Table 1, it can be seen that there is an increasing trend in each variable associated with the body mass index of respondents. The majority of respondents (60%) had malnourished status of BMI (≥25) except in the age group of 17-25 years (60%). Based on the ownership of food stalls, most of the respondents were in the category as not the owners (61.3%), with the largest prevalence in the group of respondents with not-married status (88.9%). There is a relationship between age, marital status and ownership of food stalls so that it can be said that age and marital status are very influential with the ownership of food stalls.

Based on Table 2, there is no relationship between ownership of food stalls and body mass index of respondents (0.111), but there is a tendency for food stalls owners to experience malnourished BMI (≥ 25) compared to respondents who are not food stall owners.

Table 2. Relationship between Food Stall Ownership and BMI

<table>
<thead>
<tr>
<th>Ownership status</th>
<th>Body Mass Index</th>
<th>ρ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Malmourished</td>
</tr>
<tr>
<td>Owner</td>
<td>9(22%)</td>
<td>22(71,0%)</td>
</tr>
<tr>
<td>Not as owner</td>
<td>23(46,9%)</td>
<td>26(53,1%)</td>
</tr>
<tr>
<td>Total</td>
<td>32(40%)</td>
<td>48(60%)</td>
</tr>
<tr>
<td></td>
<td>0,111</td>
<td>0,003</td>
</tr>
</tbody>
</table>

In Table 3, the risk of cardiovascular disease was found in the group who had BMI more than 25 (60.4%) and those who owned food stalls (67.7%). Statistical test results showed a significant relationship between ownership of food stalls and risk of cardiovascular disease, but there was no significant relationship between BMI and the risk of cardiovascular disease. Although unrelated, there was a tendency for respondents who had BMI ≥ 25 to experience a risk of cardiovascular disease compared to respondents who had a normal BMI.
Table 3. Relations between BMI and Ownership of Food Stalls with Risk of Cardiovascular Disease

<table>
<thead>
<tr>
<th>Variables</th>
<th>Risk of CVD</th>
<th></th>
<th></th>
<th>N (%)</th>
<th>ρ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Middle</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>11(34.4%)</td>
<td>8(25.0%)</td>
<td>13(40.6%)</td>
<td>32(100%)</td>
<td>0.055</td>
</tr>
<tr>
<td>Malnourished</td>
<td>6(12.5%)</td>
<td>13(27.1%)</td>
<td>29(60.4%)</td>
<td>48(100%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17(21.2%)</td>
<td>21(26.2%)</td>
<td>42(52.5%)</td>
<td>80(100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Food stall ownership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owner</td>
<td>1(3.2%)</td>
<td>9(29.0%)</td>
<td>21(67.7%)</td>
<td>31(100%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Not as owner</td>
<td>16(32.7%)</td>
<td>12(24.5%)</td>
<td>21(42.9%)</td>
<td>49(100%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17(21.2%)</td>
<td>21(26.2%)</td>
<td>42(52.5%)</td>
<td>80(100%)</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

Cardiovascular disease currently is the cause of more than half of the global burden of diseases which its cases will continue to increase from year to year\(^\text{20}\). The results of this study indicate a significant relationship between sex and age with the risk of cardiovascular disease (ρ=0.05). Although some characteristics, such as marital status, level of education, and tribe have no relationship, there is a difference in proportion between marital status, level of education and aspects of the tribe with a high proportion of cardiovascular risk in respondents with married status (59.7%), high education level (university) (60%), and Toraja tribes (61.5%).

Epidemiological data have shown a shift in the prevalence of risk of cardiovascular disease in which males were dominant\(^\text{21,22}\), but today, women also have a high prevalence\(^\text{20,23}\). Likewise, with age risk factors, where increasing age will be increasingly at risk of developing cardiovascular disease, but from some research results indicate a high prevalence not only in the elderly age group but also in various age groups\(^\text{24,25}\).

An increase of cardiovascular disease every year cannot be separated from lifestyle factors such as excess nutritional intake, lack of physical activity and ignorance factors\(^\text{23,26-28}\). Cooker are one type of work in the informal sector, the majority of which are small-scale business management so that in general the work activities are carried out privately so that it certainly takes longer to be in the food stall. As it is known that one of the characteristics of informal sector workers such as food stalls cooker is a small-scale business and has little capital in their work, and most of these cooks are people who migrate from other regions in opening a business in overseas\(^\text{29}\).

This is what drives the management of many food stalls by food stalls owners, starting from the preparation stage, the food management stage to the food serving stage, although from the research results most cooks are not food stall owners. Based on the results of the study, there is a very significant relationship between ownership of food stalls and risk of cardiovascular disease (ρ=0.006). Time to do routines such as exercise or rest even access to health services is reduced\(^3\). Longer working time can result in a person not having the time to interact with healthy living behaviors such as lack of rest time\(^\text{30}\), lack of physical activity as high as having a high chance of getting cardiovascular disease\(^5,28\).

The results of the study warn of the risk of cardiovascular disease experienced by more than half of the cooker (52.5%). It is necessary to control immediately to the risk factors of cardiovascular disease by providing knowledge about the prevention of cardiovascular disease risk\(^\text{31,32}\), so that workers can get which is productive and will not provide the burden of morbidity, disability and socio-economic burden for the patient’s family, the community and the state\(^3\).

**CONCLUSION**

This study concluded that the food stalls ownership of the cooks contributes to an increase of body mass index and the risk of cardiovascular disease.

**Sources of Funding:** This study is funded by Indonesia Ministry of Research, Technology, and Higher Education
Ethical Clearance: This study obtained approval by Ethical Commission of Faculty of Medicine Hasanuddin University, number 768/H4.8.4.5.31/PP36-KOMETIK/2017.

Conflict of Interest: Nil

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General Knowledge and Misconceptions about HIV/AIDS among the University Students in Malaysia

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ABSTRACT

This study was aimed to determine the general knowledge and misconceptions among the undergraduate students in a private university in Malaysia. Data was collected from a stratified random sample of 180 students using a validated questionnaire survey to assess the general knowledge and misconceptions about HIV/AIDS. The data was analysed by using the SPSS software and Chi-square test was used to find the p-value for each of the questions. The average mean score assessing the general knowledge of the students in was 82.32%, where the Health Science students scored 45.11% with a standard deviation of 0.017 and the Non-Health Science students scored 36.15% with a standard deviation of 0.026. When comparing each question using the Chi-square test, most of the answers of the Health Science students and Non-Health Science students showed a significant difference where the p-value was <0.05. From the results of this study it is clear that the Health Science students had better knowledge and fewer misconceptions than the Non-Health Science students.

Keywords: General knowledge, Misconception, HIV/AIDS, students, Malaysia.

INTRODUCTION

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV). The human immunodeficiency virus is a lentivirus that causes HIV infection and over time acquired immunodeficiency syndrome. HIV infection is one of the largest threat in the world. With only 5 percent of the Eastern and Southern African, it is home to half of the world’s population living with HIV. In recent decades, HIV/AIDS has been working its magic up into society, spreading like an unstoppable cancer, almost to the point of it being immortal. The cumulative number of HIV cases in Malaysia went up to 101,672 cases by the end of 2013 [1]. Due to lack of adequate information, youths are more exposed to infection as they engage in risky sexual practices [2].

There are few studies that have examined potential differences in knowledge and misconception towards HIV/AIDS. In Malaysia, talks and awareness programs about HIV/AIDS are held at secondary schools regularly. However, there are new cases of HIV/AIDS arising among people every year. This could be caused by low level of knowledge regarding HIV/AIDS. This shows that the awareness programs held at school levels alone is not enough to prevent this disease from spreading. However, these studies have been limited to compare integrated knowledge and misconceptions of the Health Science and Non-Health Science students. Health Science students may have a better exposure to gaining knowledge about

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this disease since it is a part of their curriculum whereas it is not the case for Non-Health Science students. It is of utter importance that both Health Science and Non-Health Science undergrads are equipped with the knowledge of HIV/AIDS. Thus, the knowledge and misconceptions about this disease among university students should also be assessed. Therefore, the aim of this study was to determine the general knowledge and misconceptions among the Health Science students and Non-Health Science students about HIV/AIDS in Lincoln University, Petaling Jaya, Selangor, Malaysia.

**MATERIALS AND METHOD**

<table>
<thead>
<tr>
<th>Study design</th>
<th>Descriptive, cross sectional study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study population</td>
<td>Undergraduate students from Lincoln University, Petaling Jaya, Selangor, Malaysia.</td>
</tr>
<tr>
<td>Sample Size</td>
<td>Total 180 among which 90 are Health Science students and 90 are Non-Health Science students</td>
</tr>
<tr>
<td>Inclusion and exclusion criteria</td>
<td>Malaysian students aged between 18-25 years old were included. The students under 18 and above 25 years old were excluded.</td>
</tr>
<tr>
<td>Study survey instrument</td>
<td>Self-administered validated questionnaire</td>
</tr>
<tr>
<td>Data Collection</td>
<td>The self-administered questionnaire was distributed and collected personally</td>
</tr>
<tr>
<td>Statistical analysis plan</td>
<td>All statistical analyses were performed using SPSS</td>
</tr>
</tbody>
</table>

**RESULTS**

The Table 1 shows the demographic characteristics of the total participants. The evaluation was conducted with 180 students of both Health Science and Non-Health Science.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total (n=180)</th>
<th>Health Science (n=90)</th>
<th>Non-Health Science (n=90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y), mean (±SD)</td>
<td>21.65 (±1.655)</td>
<td>21.18 (±1.481)</td>
<td>21.08 (±1.892)</td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>52 (29.2%)</td>
<td>26 (28.9%)</td>
<td>26 (28.9%)</td>
</tr>
<tr>
<td>Female</td>
<td>128 (70.8%)</td>
<td>64 (71.1%)</td>
<td>64 (71.1%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>180(100%)</td>
<td>90 (100%)</td>
<td>90 (100%)</td>
</tr>
<tr>
<td>Married</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Widow</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Separated</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>66 (36.2%)</td>
<td>36 (38.9)</td>
<td>30 (33.3%)</td>
</tr>
<tr>
<td>Christian</td>
<td>28 (15.6%)</td>
<td>15 (16.7)</td>
<td>13 (14.4%)</td>
</tr>
<tr>
<td>Buddhist</td>
<td>42 (23.8%)</td>
<td>16 (18.9)</td>
<td>26 (28.9%)</td>
</tr>
<tr>
<td>Hindu</td>
<td>40 (22.2%)</td>
<td>21 (23.3)</td>
<td>19 (21.1%)</td>
</tr>
<tr>
<td>Others</td>
<td>4 (2.2%)</td>
<td>2 (2.2)</td>
<td>2 (2.2%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>60 (33.3%)</td>
<td>30 (33.3%)</td>
<td>30 (33.3%)</td>
</tr>
<tr>
<td>Chinese</td>
<td>60 (33.3%)</td>
<td>30 (33.3%)</td>
<td>30 (33.3%)</td>
</tr>
<tr>
<td>Indian</td>
<td>60 (33.3%)</td>
<td>30 (33.3%)</td>
<td>30 (33.3%)</td>
</tr>
</tbody>
</table>
SD denotes standard deviation, n denotes number of participants, y denotes years

From Table 1, we can see that the mean age of the total participants was 21.65 years and its standard deviation is 1.655 years. Among the participants, 90 of them were Health Science students (50%) and 90 of them were Non-Health Science students (50%). The participants were composed of 52 (29.2%) males and 127 (70.8%) females. The participants were all Malaysians from the three major races in Malaysia (Malay n=60, Chinese n=60 and Indian n=60). The marital status of all participants is single. Among all the 180 participants, majority were Muslims 66 (36.2%) followed by Buddhists 43 (23.8%), Hindus 40 (22.2%), Christians 28 (15.6%) and others (2.2%).

The Table 2 shows the frequency and percentage of correct answers and wrong answers among the participants based on faculty of the students.

### Table2: Questions on general knowledge on HIV/AIDS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correct Answers</th>
<th>Wrong Answers</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health Science</td>
<td>Non-Health Science</td>
<td>Health Science</td>
</tr>
<tr>
<td>General Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. AIDS abbreviation</td>
<td>85 (47.2%) 55 (31.2%) 6 (3.3%) 33 (18.3%)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>2. AIDS a transmittable disease</td>
<td>82 (45.6%) 75 (41.7%) 5 (2.8%) 15 (8.3%)</td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>3. AIDS a hereditary disease</td>
<td>64 (35.6%) 36 (20.0%) 27 (15.0%) 54 (30.0%)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>4. AIDS cured at this moment</td>
<td>82 (45.6%) 74 (41.1%) 8 (4.4%) 16 (8.9%)</td>
<td>0.079</td>
<td></td>
</tr>
<tr>
<td>5. There is a vaccine for AIDS Attitudes</td>
<td>64 (35.6%) 47 (26.1%) 26 (14.4%) 43 (23.9%)</td>
<td>0.009</td>
<td></td>
</tr>
</tbody>
</table>

The table 2 showed that among the 5 questions regarding the general knowledge for HIV/AIDS, all the frequency and also the percentage of correct answers was higher in Health Science students (30.0%-50.0%) as compared to Non-Health Science students (20.0%-45.0%). In other words, the frequency and percentage of wrong answers was higher in Non-Health Science students (5.0%-30.0%) than in Health Science students (4.4%-15.0%). Significant differences were observed between the answers given by Health-Science students and also Non-Health Science students.

In Table 3, the frequency and percentage of correct and wrong answers among the participants based on their experience in science are reported (Health Science and Non Health Science Students). The table showed 5 questions related to the misconceptions about HIV/AIDS.

### Table 3: Questions on misconceptions about HIV/AIDS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correct answers</th>
<th>Wrong answers</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health Science</td>
<td>Non-Health Science</td>
<td>Health Science</td>
</tr>
<tr>
<td>Misconceptions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Love is a reason for HIV/AIDS</td>
<td>85 (47.2%) 71 (39.4%) 9 (5.0%) 14 (7.8%)</td>
<td>0.264</td>
<td></td>
</tr>
<tr>
<td>2. AIDS is a punishment of God</td>
<td>80 (44.4%) 65 (36.1%) 10 (5.6%) 25 (13.9%)</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>3. AIDS can treat by holy water</td>
<td>81 (45.1%) 82 (45.6%) 5 (2.8%) 8 (4.4%)</td>
<td>0.388</td>
<td></td>
</tr>
<tr>
<td>4. AIDS do not come after marriage</td>
<td>79 (43.9%) 71 (39.4%) 11 (6.1%) 19 (10.6%)</td>
<td>0.110</td>
<td></td>
</tr>
<tr>
<td>5. AIDS can be transmitted by the cough</td>
<td>81 (45.0%) 70 (38.9%) 9 (5.0%) 20 (11.1%)</td>
<td>0.026</td>
<td></td>
</tr>
</tbody>
</table>
From this Table 3, we can see that the frequency and percentage of correct answers was higher in Health Science Students compared to Non-Health Science Students and vice versa for the wrong answers. The majority of Health Science respondents had less misconception about HIV/AIDS, with 75-85% correctly answering the five statements. However, many misconceptions were still noted relating to HIV/AIDS, such as “AIDS is a punishment of God”, “AIDS can be transmitted by cough” and “AIDS do not come after marriage” which at least of more than 10% of Non-Health Sciences Students had answered incorrectly.

The Table 4. represented the mean and standard deviation of all the other tables (Table 1, 2 and 3).

**Table 4: Total Average of All Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correct answers</th>
<th>Wrong answers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health Science</td>
<td>Non-Health Science</td>
</tr>
<tr>
<td>General Knowledge</td>
<td>44.12% (±0.062)</td>
<td>32.12% (±0.094)</td>
</tr>
<tr>
<td>Misconceptions</td>
<td>46.10% (±0.013)</td>
<td>40.44% (±0.036)</td>
</tr>
<tr>
<td>Mean (±SD)</td>
<td>45.11% (±0.017)</td>
<td>36.15% (±0.026)</td>
</tr>
</tbody>
</table>

SD denotes standard deviation

**DISCUSSION**

As far our knowledge, this is the first descriptive, cross-sectional study conducted to determine the general knowledge and misconceptions of HIV/AIDS among the Health-Science students and Non-Health Science students in Lincoln University. Since HIV is a very common infection, it is important that people should have ample knowledge and awareness about HIV/AIDS. This study could have a positive impact on raising awareness of HIV/AIDS knowledge and misconceptions among undergraduate students in Malaysian Universities. Educational awareness programs about HIV/AIDS have been one of the key measures in controlling the infection, as they promote the healthy life style of the general public [3, 4]. The study reveals several findings about the general knowledge and misconceptions among Health Science students and also Non-Health Students in Lincoln University.

**GENERAL KNOWLEDGE**

About 78% of the respondents of both branches (Health Science students and Non-Health Science students) had a clear understanding about the abbreviation used for HIV/AIDS. The Health Science students had answered more correctly and possess a better knowledge of HIV/AIDS than the Non-Health Science students. Both the groups had good knowledge about AIDS which cannot be cured having a high percentage of correct answer.

About the concept of “AIDS is a hereditary disease” and “there is a vaccine for AIDS”, the Health Science percentage of answering correctly was higher as compared to Non-Health Science percentage. In our study, however about 20%-35% of the respondents thought that AIDS is not a hereditary disease whereas about 26%-36% of the respondents thought there was no vaccine available for AIDS. Thus, overall the respondents had good knowledge about the abbreviation of AIDS, AIDS transmission and its curing except they lack knowledge of AIDS being a hereditary disease and whether there is a vaccine available for AIDS. A similar study was conducted in Tanzania; it spoke about three quarters of the respondents demonstrating comprehensive knowledge about HIV/AIDS [5, 6]. In contrast, a study conducted in Saudi Arabia showed the overall mean knowledge score of the respondents was 5.2 correct answers out of 9. However, in this study a low knowledge level of HIV/AIDS was found among the medical and non-medical students [7]. Another study that was conducted among Sudanese University students stated that the participants had poor knowledge about HIV/AIDS [8]. Therefore, it is important to consider taking initiative in setting up various centres in order to instil a basic knowledge about the disease all around the world so that as to eliminate the stigma surrounding this
disease.

**Misconceptions**

It is very common to have some misconception about HIV/AIDS in any population. Misconception about HIV may cause a negative attitude towards people suffering from this serious disease that could lead to serious harm on their physical and emotional state. Misconception is a major barrier to control and prevent the spread of AIDS\(^9,10\).

Since Malaysia is a conservative country where it is not encouraged to talk about sexual issues, the expected rate of misconceptions is very high. This is also the same with other conservative countries like Sudan for example where it is rare for parents to discuss sensitive topics such as STDs with family members\(^11\). But our study revealed that most of the respondents didn’t have a lot of misconceptions about HIV/AIDS. However, our findings showed that the Non-Health Science respondents had a higher percentage of misconceptions than the Health Science respondents.

The highest misconceptions from both populations were with the statements “AIDS is a punishment of God”, “AIDS do not come after marriage” and “AIDS can be transmitted by the cough”. Even though Malaysia is a religious country, for the statement “AIDS is a punishment of God” only few participants 10 (5.6%) from Health Science and 25 (13.9%) from Non-Health Science had incorrect answers. Other studies however, have shown that there was a higher percentage of people who believe that AIDS is a divine punishment from God\(^4,8\). Also comparing to a study done in Sudan for the statement “AIDS do not come after marriage”, 11 (6.1%) participants of Health Science and 19 (10.6%) participants of Non-Health Science answered incorrectly. Finally, for the statement “AIDS can be transmitted by the cough”, 9 (5.0%) participants of health science and 20 (11.1%) of non-health science answered incorrectly. A study conducted earlier in Japan showed that fear, lack of knowledge, or religious beliefs, negative attitudes towards HIV/AIDS patients can lead to stigmatization of the disease\(^12\). It is very important to take action in order to get rid of these misconceptions that people have towards HIV and AIDS. South Africa has set an interesting example in implementing HIV/AIDS prevention programs including community-based HIV awareness programs and education campaigns, research on HIV prevention together with the introduction of antiretroviral therapy (ART). This comprehensive approach has led to increased knowledge within the community which reduced the social stigma and led again to better uptake of voluntary counselling and HIV testing\(^13\). The Malaysian government could take up few of these above examples so as to create better awareness and knowledge among the population of the country.

**CONCLUSION**

The major findings of this study were that the Health Science students had better knowledge and fewer misconceptions when compared to Non-Health Science students. This study draws a general picture of student population’s knowledge and misconceptions towards HIV/AIDS. Though the SEGi student population had a good knowledge background, there were few misconceptions that need to be addressed. However, Furthermore, from the study we come to a conclusion that despite the knowledge that the students possess it is important to raise awareness about this disease, and this can be done by taking initiative in conducting campaigns, awareness programs, educational speeches, hosting fundraising events, produce information pamphlets and through social media awareness.

**Ethical Clearance**- Taken from ethical committee of Faculty of Science, Lincoln University, Petaling Jaya, Selangor Malaysia. All the respondents were given a consent letter to read, accept and sign before they fill the questionnaire.

**Source of Funding**- Self

**Conflict of Interest** - Nil

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Supportive Group Therapy as a Prediction of Psychological Adaptation of Breast Cancer Patients Undergoing Chemotherapy

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ABSTRACT

Background. Breast cancer is the main cause of death for women. One of the therapies for breast cancer is chemotherapy. Chemotherapy has physical and psychological side effects. Patients need to adapt in order to be able to follow the process of chemotherapy treatment, and supportive group therapy is one of the ways to improve adaptation ability of patients. The aim of this study was to analyze supportive group therapies in improving the psychological adaptation of breast cancer patients undergoing chemotherapy.

Method. This study uses pre-experimental one group pretest-posttest design. The sample consists of 35 respondents that were divided into 3 groups during the treatment. Pre-test and post-test were conducted to each group by using Likert scale. This study uses sampling technique of purposive sampling with inclusion criteria.

Results. Before supportive group therapy is conducted, the average score of the respondents are 35,85 meanwhile after the supportive group therapy is conducted the average score increases to 43,82. The statistical analysis by using paired t-test shows that p-value .000 < 0,05 and this demonstrates that the supportive group therapy can improve psychology adaptation of breast cancer patient who undergone chemotherapy.

Conclusions. Supportive group therapy can be an alternative to support the breast cancer patients to adapt and undergone chemotherapy.

Keywords: Chemotherapy, Supportive group therapy, psychology adaptation

INTRODUCTION

Cancer is one of the deadliest disease worldwide¹,². According to the data from International Agency For Research On Cancer (IARC) of the year of 2012, there were 4,1 million new cases of cancer with the mortality rate of 8,2 million¹,³,⁴. The data on mortality caused by cancer worldwide demonstrates that the most commonly diagnosed cancer type for men is lung cancer (30%). For women, the most commonly diagnosed cancer types are cervical cancer while breast cancer (12,9%) is in the second position¹,³,⁵.

According to the study entitled Surveillance and Health Service Research from American Cancer Society 2012, breast cancer is an oncology case that often occurs to women. There are approximately 1.7 million breast cancer patients throughout the world and 521,900 of them has passed away⁶,⁷. Breast cancer contributes 25% of the total cases of cancer and it is responsible for 15% of female deaths due to cancer worldwide⁶,⁷. According to the study from Cancer Epidemiology Biomarker, there are 1.7 million cases of breast cancer worldwide, 39% of the patients are from Asia, 29% in Europe, 15% in Amerika, 8% in Afrika, and 1.1% in Australia. Based on such data, Asia is the
continent with the highest percentage of breast cancer patients6,7.

Cancer patient should get a treatment to reduce metastasis of cancer cell in order to prevent the cancer spread to other body parts which may cause death 2,8,9. Chemotherapy is very important in cancer treatment besides radiation, surgery, as well as the injection of cytotoxic and anticancer. These are the main treatments which required to eliminate the cancer cells from the body10. However, the use of anti-cancers often have a side effect which harming the patients10. The use of chemotherapy has various impacts, including physical and psychological impacts.

Side effects of chemotherapy arise because the substances are very strong and such substances do not only kill cancer cells, but also attack healthy cells, especially cells that divide rapidly, such as hair cells, spinal cord, skin, mouth and bones and digestive tract9,11. In addition, the psychological impact that arises out from chemotherapy makes the majority of cancer patients worry, anxious, and fear of facing the threat of death and pain during the chemotherapy treatment5,11. This psychological response varies from person to person, it really depends on the stage of the cancer, the type of treatment being carried out and the characteristics of each patient7,12. The psychological impacts which often experienced by breast cancer patients undergoing chemotherapy are the feeling of helplessness, anxiety, shame, decreased self-esteem, stress, and anger13,14. Efforts should be made to improve coping mechanisms for cancer patients so that the result of the chemotherapy will be more optimum. The study conducted by Spahni, Bennett & Perrig, 2016 suggests that a person’s adaptability is strongly influenced by the maturity and maturity of a person’s age15–17. Psychological adaptation of patients with chemotherapy requires support from all parties, both from family, friends, and healthcare providers13,16,18. This is important so that during the chemotherapy the patient will be able to receive all the side effects of the treatment15,19. According to Clessen, et.all 2008, psychological changes in cancer patients can be adapted to supportive group therapy5,20. Another study conducted by Yavusyen et al. (2012) suggests that support groups therapy can improve the life quality of breast cancer patients5,21,22.

Material and methods

Design

This study uses pre-experimental with pre-post test which designed to examine whether supportive group therapy can improve the psychological adaptation ability of patient who undergoing chemotherapy23,24.

Sample

This study involves 35 breast cancer patients as the respondents who undergo chemotherapy at the chemotherapy center at Jember Hospital, Indonesia. The sample is divided into 3 groups, each group consists of 12 or 11 people. Such division is intended to make the interaction among the patients more effective25,26. The characteristic of sample in this study is a patient with breast cancer level II or III, who has undergone chemotherapy for more than 3 times, co-operative and able to communicate verbally, and agree to be a respondent. While exclusion criteria that used to eliminate confounding variable is the breast cancer patient level II and III who has complications due to cancer. This study used purposive sampling, which is a self-determined sampling technique which adjusted with the specified criteria23,26.

Measurement

The data collection procedures from 35 samples are divided into small groups with each group member as many as 11-12 people. Each group is accompanied by cancer therapists and volunteers. Interventions are carried out in 1 meeting by combining 4 sessions in one meeting. Data collection on psychological adaptation was conducted twice, namely before supportive group therapy and after intervention. The therapy is conducted in a quiet room, for 90 minutes. Assessment of the psychological adaptation of respondents includes cognitive, affective and psychomotor assessment using a Likert scale26.

Data analysis

In order to analyse the different group by using paired sample t-test, with value of alpha < 0.0525,26. Previously, data normality tests were conducted on the two groups26.
RESULTS

Table 1. Respondent Demographic Data
Frequency Distribution

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>f</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40 years</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>40 – 50 years</td>
<td>16</td>
<td>48.6%</td>
</tr>
<tr>
<td>&gt;50 years</td>
<td>18</td>
<td>51.4%</td>
</tr>
<tr>
<td>Education Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>21</td>
<td>60.0%</td>
</tr>
<tr>
<td>Junior High</td>
<td>6</td>
<td>17.1%</td>
</tr>
<tr>
<td>Senior High</td>
<td>7</td>
<td>20.0%</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Married</td>
<td>27</td>
<td>77.1%</td>
</tr>
<tr>
<td>Widow</td>
<td>7</td>
<td>20.0%</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Servant</td>
<td>3</td>
<td>8.6%</td>
</tr>
<tr>
<td>Employee</td>
<td>4</td>
<td>11.4%</td>
</tr>
<tr>
<td>Enterpreneur</td>
<td>10</td>
<td>28.6%</td>
</tr>
<tr>
<td>Farmer</td>
<td>4</td>
<td>11.4%</td>
</tr>
<tr>
<td>Housewife</td>
<td>14</td>
<td>40.0%</td>
</tr>
<tr>
<td>The frequency of chemotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 times</td>
<td>9</td>
<td>25.7%</td>
</tr>
<tr>
<td>6 times</td>
<td>8</td>
<td>22.9%</td>
</tr>
<tr>
<td>7 times</td>
<td>8</td>
<td>22.9%</td>
</tr>
<tr>
<td>8 times</td>
<td>5</td>
<td>14.3%</td>
</tr>
<tr>
<td>9 times</td>
<td>4</td>
<td>11.4%</td>
</tr>
<tr>
<td>10 times</td>
<td>1</td>
<td>2.9%</td>
</tr>
<tr>
<td>Breast cancer level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>57.1%</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>42.9%</td>
</tr>
</tbody>
</table>

Based on the analysis of respondents demographic data, most respondents (18 respondents) are >50 years old with the percentage of 51.4%. While the highest chemotherapy frequency is 5 times with the total of 9 respondents (25.7%). Most of the respondents are in level 3 of breast cancer, with the total of 20 respondents (57.1%) (Table 1).

Table 2 Frequency Distribution of Respondents
Based on the status of psychological adaptation of breast cancer patients before and after supportive group therapy

<table>
<thead>
<tr>
<th>Value</th>
<th>Before Supportive Group Therapy</th>
<th>After Supportive Group Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>29</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>35.85</td>
<td>43.82</td>
</tr>
<tr>
<td>Median</td>
<td>36.00</td>
<td>44.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2,475</td>
<td>4,768</td>
</tr>
</tbody>
</table>

Based on the table 2, to analyse paired t-test, normality data test is conducted by using Shapiro wilk test with significance of 0.05 and the result shows that the score for pre-test and post test are > 0.05, thus, it can be concluded that the variables are distributed normally.

Table 3 Analysis of the effect of supportive group therapy on psychological adaptation of cancer patients undergoing chemotherapy.

<table>
<thead>
<tr>
<th>Psychological adaptation</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Deviation</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>35</td>
<td>29</td>
<td>42</td>
<td>35.85</td>
<td>36.00</td>
<td>2,475</td>
<td>0.000</td>
</tr>
<tr>
<td>Pos-test</td>
<td>35</td>
<td>34</td>
<td>52</td>
<td>43.82</td>
<td>44.00</td>
<td>4,768</td>
<td></td>
</tr>
</tbody>
</table>

The results of the analysis using paired t-test suggest that P value is 0.000 <0.05 and thus, supportive group therapy can improve the adaptation of patients undergoing chemotherapy (Table 3).

DISCUSSION

Adaptation ability of a person is also depending on the age, the more mature, the more mature the meaning of life will be. So they will be wiser in responding to any stressors. The results of this study indicate that most respondents are in middle adulthood. According to Hurlock (2009), middle adulthood is a transition period and a period of readjustment with behavioral patterns that have been carried out in early adulthood with physical and psychological changes occurring in middle
This result corresponds to a study conducted by Khariyatul (2017) which shows some factors that affecting adaptation ability, which is the age of the respondent who are more than 50 years old, and thus age greatly affects the adaptability of breast cancer patients undergoing chemotherapy28,30.

Another factor that affects the adaptation ability is marital status. According to Pamungkas (2011), the participation of families and those around the patient to provide life support for breast cancer patient will be very significant. The family must take care so that the patient does not experience stress and depression of the disease they are suffering from. The research conducted by Nurhidayati, T. & Rahayu, D. A. (2017) shows that the support of partners are obtained in the form of instrumental, appreciation, emotional support and information5.

The results above show that average score of psychological adaptation of respondents after (post-test) supportive group therapy is conducted increase to 43.82, with the minimum score of 34 and the maximum score of 52 and thus, it can be qualified as ‘adaptive’ and the standard deviation is 4,768. This result demonstrates that the breast cancer patients undergoing chemotherapy are more adaptive in addressing the disease. This result corresponds to the study conducted by Nurcahyani, Dewi, & Randhianto (2016) which focuses on the effect of group supportive therapy on anxiety. Adaptability can also be influenced by one’s religion and beliefs5. At the age of 50-60 years the level of religiosity is higher because good religiosity can affect a person’s acceptance of his condition so that patients will be more adaptive. The higher the religiosity the lower the depression level, and vice versa31.

The result from the t-test analysis on 35 respondents shows that the p score is .000 <0.05, thus H1 is accepted, which demonstrates that there is a correlation between supportive group therapy and the psychological adaptation of breast cancer patients undergoing chemotherapy. Supportive group therapy is a therapy that is carried out using peer groups who have relatively similar problems by sharing information about the problems experienced as well as solutions that need to be taken while the process of mutual learning and strengthening is very effective if done so that patients can adapt to their current situation5,11,28,32. According to the results of Yafuzsen’s research, et al, (2015) supportive therapy groups has an influence on the changes in self-esteem between the intervention group and the control group32.

**CONCLUSION**

Supportive group therapy can be an alternative for the healthcare providers to improve the psychology adaptation in order to support the healing process. This therapy can be conducted along with other therapies which performed by a professional healthcare provider.

**Ethical Clearance:** This study has passed the institutional review board from Faculty of Health Sciences, Universitas Muhammadiyah Jember.

**Source of Funding:** This study is self-funded research project.

**Conflict of Interest:** None

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The Effectiveness of “Neherta” Model as Primary Prevention of Sexual Abuse against Primary School Children in West Sumatera Indonesia 2017

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ABSTRACT

Background: sexual abuse against elementary school children occurs in many countries around the world, including Indonesia. A module of “Neherta” model is one of intervention model of sexual abuse prevention that can be provided for primary school children. Aim & Objective: To know the effectiveness intervention Module of sexual abuse prevention against Children from “Neherta” model. Material & Method: Research Design Quasi-Experiments type Times Series Design with 864 samples. The study was conducted in Batusangkar City from Mei 2017 to November 2017. Data is analyzed using average grade of knowledge and attitudes of primary school-aged children. it proved by the results of multivariate tests, with a value of P = 0.00. Conclusions: Modules of the “Neherta” model proved to be effective increasing the average value of knowledge and elementary school-aged children’s assertiveness in West Sumatra. It is recommended to test the module from the “Neherta” model in elementary school children outside West Sumatra.

Keywords: Neherta model, sexual violence, elementary school age children, intervention.

INTRODUCTION

Primary prevention by providing direct intervention to children in a school-based are efficient and effective. this is effective because it will involve several prevention strategies, such as community, teachers, students, parents and other environments around (1, 2). one of the effective intervention modules is “Neherta” model which is made through the long stage as a result of doctoral dissertation(3).

The module of “Neherta” model is one of the best intervention modules to increase knowledge and assertiveness of school-age children(3). The learning method of this model based on school-age characteristics which are love to play and sing. it uses presentations, story discussions, pictorial sketches, video, roleplay, leaflet and singing with a minangkabau lyric as the learning media “Neherta” The learning method of this model based on school-age characteristics which are love to play and sing. it uses presentations, story discussions, pictorial sketches, video, roleplay, leaflet and singing with a minangkabau lyric as the learning media (3). with a variety of learning, media will make them enjoy the lesson. therefore the purpose of this research is to see the effectiveness of “Neherta” model toward elementary school students in West Sumatra

MATERIAL AND METHOD

This is quantitative research using quasi-experiments design with times series design. the population in this study are all the elementary student in West Sumatra with +819660 students. the sample in this study based on a krecjie table with 5% error is 864 students. The sample was selected randomly with multistage random sampling framework, ranging from a city, and sub-district and Nagari. The sample selected by purposive sampling, it only take students on the 3rd year, 4th year and 5th year, with inclusion criteria: respondents always attend the class, health both physical and spiritual

The intervention did 3 times for 2 months with 4 times measurement, they are the average of knowledge and the average of assertive attitude from the respondent. the data were analyzed by general linear model repeated measure. this study done in elementary school in West Sumatra for 9 months, started in mei until November
2017, this study was funded by the research unit of nursing faculty of Andalas University

Respondents are divided into 3 groups

a. respondent that came from district/city area
b. respondent that came from sub-district area
c. respondent that came from Nagari

- all groups are given the same intervention using “Neherta” model
- the interventions are given by teachers from their school
- All teachers that give the intervention have been trained
- the interventions are given 3 times for 2 months with 4 times of measurement; pre-intervention measurement, after the first intervention, after the second interventions, and after the last intervention

The intervention of knowledge that given to children are

- 4 important and secret part of their body
- they are allowed to say “no”
- the seduction pattern used by the sex offender
- perpetrators of sexual abuse against children
- what should their do if they have been victimized

FINDINGS

this study followed by 864 respondents and divided into three groups, the 1st group is a group that came from district/city area, the 2nd group is respondent that came from sub-district area and the last respondent is that came from Nagari. the intervention is given 3 times with the same intervention, using ‘Neherta’ model. the interventions are given by their own respondent’s school teacher. All teachers that give the intervention have been trained by researcher and they gave the similar perception by researcher it takes students on the 3rd year, 4th year and 5th year. consist of 61% women and 39% men. 30% respondents are 9 years old, 38% respondents are 10 years old, 28% respondents are 11 years old and 4% respondents are 12 years old. all respondents are Muslim from normality result test using Kolmogorov-Smirnov test known that the data normally distributed, so the data processing using General Linear Model Repeated Measure analysis can be used. The data shows the increase of average value in knowledge and assertive attitudes of respondent after receiving the intervention. the increase of average value in knowledge and assertive attitudes occurred in all groups of intervention respondent. to prove the increase of average value in knowledge and assertive attitudes of these 3 groups can be seen in hypothesis test in table 1.

Table 1: Statistical test results on the average increase of Knowledge and Attitude

Assertive between the three groups of respondents in 4 times the measurement.

<table>
<thead>
<tr>
<th>Multivariate^ab</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Subjects Effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>factor1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai’s Trace</td>
<td>.822</td>
<td>600.502</td>
<td>6.000</td>
<td>5166.000</td>
<td>.000</td>
<td>.411</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>.193</td>
<td>1099.092c</td>
<td>6.000</td>
<td>5164.000</td>
<td>.000</td>
<td>.561</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>4.109</td>
<td>1767.547</td>
<td>6.000</td>
<td>5162.000</td>
<td>.000</td>
<td>.673</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>4.090</td>
<td>3521.868d</td>
<td>3.000</td>
<td>2583.000</td>
<td>.000</td>
<td>.804</td>
</tr>
<tr>
<td>factor1 * KLP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai’s Trace</td>
<td>.012</td>
<td>2.496</td>
<td>12.000</td>
<td>5166.000</td>
<td>.003</td>
<td>.006</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>.988</td>
<td>2.501e</td>
<td>12.000</td>
<td>5164.000</td>
<td>.003</td>
<td>.006</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>.012</td>
<td>2.505</td>
<td>12.000</td>
<td>5162.000</td>
<td>.003</td>
<td>.006</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>.011</td>
<td>4.696d</td>
<td>6.000</td>
<td>2583.000</td>
<td>.000</td>
<td>.011</td>
</tr>
</tbody>
</table>
Table 1 is multivariate result test, the test is to know the existence of the increase of the average value in knowledge and attitudes assertive of respondents in the three research groups. From table 4 can be seen that the increase in average knowledge and assertive attitude of respondents did rise. This increase is found in the three groups, where the increase occurs one week after getting the intervention, the p-value in the factor is 0.00.

This increase in average value continues to occur until the fourth measurement, it is after the third intervention. Interventions that given to the three groups are equally effective in increasing the average of the knowledge and assertive attitudes of the three groups. It can be seen from the p-value on the group factor * shows the value of 0.003.

Table 2: The statistical test results on the increase in average knowledge and Assertiveness in the three intervention groups, where the initial average score (before intervention) as a comparison (simple contrast)

<table>
<thead>
<tr>
<th>Source</th>
<th>Measure</th>
<th>factor1</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>factor1</td>
<td>Knowledge</td>
<td>Level 1 vs. Level 4</td>
<td>14373.352</td>
<td>1</td>
<td>14373.352</td>
<td>3793.639</td>
<td>.000</td>
<td>.815</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>10113.352</td>
<td>1</td>
<td>10113.352</td>
<td>2829.496</td>
<td>.000</td>
<td>.767</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>5007.407</td>
<td>1</td>
<td>5007.407</td>
<td>3578.010</td>
<td>.000</td>
<td>.806</td>
</tr>
<tr>
<td>factor1</td>
<td>Assertiveness</td>
<td>Level 1 vs. Level 4</td>
<td>9794.307</td>
<td>1</td>
<td>9794.307</td>
<td>5383.954</td>
<td>.000</td>
<td>.862</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>5571.338</td>
<td>1</td>
<td>5571.338</td>
<td>2552.374</td>
<td>.000</td>
<td>.748</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>2210.560</td>
<td>1</td>
<td>2210.560</td>
<td>830.404</td>
<td>.000</td>
<td>.491</td>
</tr>
<tr>
<td>factor1</td>
<td>Knowledge</td>
<td>Level 1 vs. Level 4</td>
<td>4.488</td>
<td>2</td>
<td>2.244</td>
<td>.592</td>
<td>.553</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>1.211</td>
<td>2</td>
<td>.605</td>
<td>.169</td>
<td>.844</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>3.627</td>
<td>2</td>
<td>1.814</td>
<td>1.296</td>
<td>.274</td>
<td>.003</td>
</tr>
<tr>
<td>factor1</td>
<td>Assertiveness</td>
<td>Level 1 vs. Level 4</td>
<td>10.391</td>
<td>2</td>
<td>5.196</td>
<td>2.856</td>
<td>.058</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>31.266</td>
<td>2</td>
<td>15.633</td>
<td>7.162</td>
<td>.001</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>7.433</td>
<td>2</td>
<td>3.716</td>
<td>1.396</td>
<td>.248</td>
<td>.003</td>
</tr>
<tr>
<td>Error(factor1)</td>
<td>Knowledge</td>
<td>Level 1 vs. Level 4</td>
<td>3262.160</td>
<td>861</td>
<td>3.789</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>3077.437</td>
<td>861</td>
<td>3.574</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>1204.965</td>
<td>861</td>
<td>1.399</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assertiveness</td>
<td>Level 1 vs. Level 4</td>
<td>1566.302</td>
<td>861</td>
<td>1.819</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 2 vs. Level 4</td>
<td>1879.396</td>
<td>861</td>
<td>2.183</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level 3 vs. Level 4</td>
<td>2292.007</td>
<td>861</td>
<td>2.662</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that the average increase of knowledge and assertive attitudes of respondents occurred in the three intervention groups. The increase of the average value of knowledge and attitude has begun to occur in the second measurement, that is after getting the first intervention, this condition is proved by the value of p = 0.00, both knowledge and assertive attitude.
Table 3: The statistical test results on the increase in the average value of knowledge and assertiveness groups by group comparison.

<table>
<thead>
<tr>
<th>Source</th>
<th>Measure</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>Knowledge</td>
<td>41278.685</td>
<td>1</td>
<td>41278.685</td>
<td>59511.160</td>
<td>.000</td>
<td>.986</td>
</tr>
<tr>
<td></td>
<td>Assertiveness</td>
<td>42486.634</td>
<td>1</td>
<td>42486.634</td>
<td>43528.389</td>
<td>.000</td>
<td>.981</td>
</tr>
<tr>
<td>KLP</td>
<td>Knowledge</td>
<td>8.725</td>
<td>2</td>
<td>4.362</td>
<td>6.289</td>
<td>.002</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>Assertiveness</td>
<td>.660</td>
<td>2</td>
<td>.330</td>
<td>.338</td>
<td>.713</td>
<td>.001</td>
</tr>
<tr>
<td>Error</td>
<td>Knowledge</td>
<td>597.215</td>
<td>861</td>
<td>.694</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assertiveness</td>
<td>840.394</td>
<td>861</td>
<td>.976</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3, is the test results of differences between groups, it shows that there is no difference of the average increase in knowledge value and assertive attitude between the three groups, with p = 0.014 for knowledge and p = 0.001 for assertive attitudes. It means the interventions given with module from the “Neherta” model to the three groups effectively increase the average of knowledge and assertive attitudes of the respondents to all the intervention groups.

The increasing of the average value in knowledge and the assertive attitude of the three groups can be seen in Figure 1 and Figure 2.

Figure 1: Graph of the average increase in knowledge value of respondents, after get 3 times intervention according to 4 times the measurement
From Figure 1 and Figure 2 it is clear that the average increase in the value of knowledge and assertive attitudes of the three intervention groups.

**DISCUSSION**

Sexual abuse against school-aged children is increasing from year to year in various countries around the world (3-6). This sexual abuse harms the child, both physically, financially, and psychologically. The physical effects on children due to sexual abuse include Vaginitis, urinary tract infections, reproductive system infection (7). While the psychological impacts are depression, social disturbance, psychiatric disorders (5) the financial impact is the increase in expenditure on treatment of victims (8). Violence against children is not only harmful to children but also harm their family and country.

It will disadvantage the family, the children’s victim of sexual abuse will spend a lot of time and amount of money to treat children’s physical and psychological (9-12) beside that it will impact the country by the increasing amount of state expenditures for the treatment of children’s victim of sexual abuse. This has been proven by research (13).

Sexual abuse against children is one of the public health issues that require its resolution, as it will have a devastating impact on society (12, 14, 15). Therefore it should be immediately done apparent result to avoid child from sexual abuse. One of the efforts that have been done is to provide the health education to children (3, 16).

The “Neherta” model is one of the intervention models for elementary school age children from research dissertation study and has been tested on 180 students. “Neherta” model intervention has also been carried out through research involving two different professions, nurses, and teachers. from the trials and studies by two different professions are known that the intervention of the “Neherta” model increased the knowledge and assertive attitudes of primary school-aged children.

The “Neherta” model intervention is one of the model using various teaching media (presentation, video, discussion using pictorial story sketch, role play, leaflet and sexual abuse prevention song by using Minangkabau, West Sumatra local language) and is set based on school-age characteristics who love to learn while playing. this Neherta model applied only in Padang the capital city of West Sumatra, to see the effectiveness of Neherta model to school-age children either in the city nor in Nagari/village, it is necessary to do another research involve the respondents from the district/city, subdistrict, and Nagari.

The result of the research has been found that Intervention model “Neherta” is effective to improve the knowledge and attitude of school-age children in all groups of respondents (table 3). The results also proved by the results of multivariate test in Table 4 (p = 0.003) on
the statistical test results there is an increase of average knowledge and assertive attitude in the three intervention groups, where the initial average value (before the intervention) as a comparison (simple contrast) known that the average increase of knowledge and attitudes of assertive respondents has occurred starting from the first week (table 5) with the \( p = 0.00 \) after receiving the first intervention the average value of knowledge and assertive attitude of respondents has started to rise. The increase in the average value of knowledge and assertive attitude on the three groups of respondents always increases in every measurement (table 6) \( p = 0.00 \). It can be seen clearly in Figure 1 and Figure 2.

**CONCLUSION**

Modules of the “Neherta Model” proved to be effective and efficient to improve the knowledge and elementary school students’ attitudes of assertive in West Sumatran.

**Conflict of Interest:** No conflict of interest arose in this study

**Source of Finding:** This study was conducted using a source of funds derived from the researcher himself

**Ethical Clearance:** This study has passed of the medical research ethics of the Dr. M. Djamil Hospital Padang Indonesian.

**REFERENCES**


Impact of Strategic Information System on Quality of Public Healthcare Services

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ABSTRACT

The aim of this article is to study the impact of strategic information system on quality of public healthcare services in Iraq. After a brief literature review, an empirical study was conducted among 206 physicians of Baghdad hospitals. To this end, a model has been developed to be tested by structural equation modeling. The results of this study showed that strategic information system directly affected the quality of public healthcare services.

Keywords: Strategic Information System, Information Quality, E-service, Healthcare Services.

INTRODUCTION

Before the era of wars in the country and the subsequent sanction against it, Iraq had a very high standard of healthcare when compared to other countries in the Arab region. The deterioration in the country’s health sector did begin during the Iran-Iraq war and continued to decline even further when the country received numerous economic sanctions. As at the early 21 century, the country’s healthcare sector, including supplies of medical equipment, the health infrastructure and healthcare personnel had been greatly compromised as a result of both the sanction and the war. The country has been struggling since then to provide the essential primary health care services. Besides, healthcare in the country continues to be centralized and therefore not well restored.

Accordingly, it needs more effective factors that lead to improve quality of public healthcare services. Therefore, it has emerged as a competitive alternative, requiring effective strategic tools like strategic information system (SIS), which has three primary dimensions which include quality of the data as given by the patient and collected by the practitioner, the quality of e-service provided and the quality of the system. Quality of the information refers to the comprehensiveness, timeliness and accuracy of the information given and collected. Quality of information is central in healthcare as it provides the bases for decision making, planning and service provision, which all affect the quality of service. E-Service quality on the hand refers to the degree with which patients’ expectations are met. It is the difference between the customer’s expectations and perceptions about the service provided. Lastly, a quality SIS can be said to that which assures security, privacy and ensures that all processes of data handling are efficient and cheap. Combination of these characteristics makes the customer at ease to provide complete information necessary for their service satisfaction. In this context, several scholars have studied the relation between SIS and QPHS. SIS allows acquisition, analysis, and protection of both traditional and digital forms of medical data that is important for the provision of quality of healthcare service. After contentment that quality of SIS is vital for quality of healthcare. Furthermore, it is essential for healthcare because allows for evidence-based decision making.

The current paper will explore the issue using evidence from Iraq. The purpose of the paper is to add literature into the ongoing debate whereby healthcare enthusiasts still disagree to agree that strategic information system impacts the quality of health care service. The paper standpoint is that the strategic information system significantly affects the quality of public healthcare services.
MATERIAL AND METHOD

Research Model

The theoretical model of this study consists of strategic information system (SIS) as independent variable with three dimensions 1) information quality (InfQ) ;2) e-service quality (EsQ) and 3) system quality (SyQ) ,and quality of public healthcare services (QPHS) as dependent variable. According to the above discussion the following hypotheses are setup:

Hypotheses 1 : Strategic information system has a significant Impact on quality of public healthcare services.

Hypotheses 1a: Information quality has a significant Impact on quality of public healthcare services.

Hypotheses 2a: E-service quality has a significant Impact on quality of public healthcare services.

Hypotheses 3a: System quality has a significant Impact on quality of public healthcare services.

Sample

The quantitative research was done targeted Iraqi physicians in Baghdad hospitals. A questionnaire with 22 items is used as a tool , 300 Iraqi physicians were randomly selected to participate in the study, among them 229 (76.3%) responded and answered the questionnaire, however, 23 questionnaires were uncompleted and the final analyzed questionnaires were 206.

FINDINGS

A questionnaire were applied in order to gather the data .Before applying to fill the questionnaire a pilot study was conducted, and this pilot study was formed and sent to eleven experts (both physicians and university professors) from different hospitals and universities for evaluation.

The reliability analysis for both SIS and QPHS scale was conducted using Cronbach alpha coefficient using SPSS V.23 , it recorded a quit good values (>0.70) and the output is shown in Table 1.

Table 1. Reliability Outputs of items in strategic information system and quality of public healthcare services

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value recorded</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS</td>
<td>0.732</td>
<td>Quite Good</td>
</tr>
<tr>
<td>InfQ</td>
<td>0.748</td>
<td>Quite Good</td>
</tr>
<tr>
<td>EsQ</td>
<td>0.712</td>
<td>Quite Good</td>
</tr>
<tr>
<td>SyQ</td>
<td>0.708</td>
<td>Quite Good</td>
</tr>
<tr>
<td>QPHS</td>
<td>0.834</td>
<td>Quite Good</td>
</tr>
</tbody>
</table>

The hypotheses developed in this study were tested using structural modeling (SEM). Encourages the more confirmatory and less exploratory modeling; therefore, it is suitable for theoretical testing rather than theoretical development. It usually starts with a hypothesis, represents it as a model with a measuring instrument, and tests the model.

Additionally both SPSS v.23 and Amos v.18 was applied which enabled to figure out cross-relations between constructs and explore a draft model into a fitting one. In order to test the validity, a draft model derived from a previous corrected path analysis was applied in Amos. After revising the model several times (Modification Indices), an accepted model is achieved which shows a perfect fit in terms of all required goodness of fit tests of structural equation modeling.

Table 2 shows strategic information system model, it has a Chi-square value of 241.123 and degrees of freedom = 50, with ratio (4.822). It was failed to reject to model. This statistic supports that the differences of the predicted and actual matrices are non-significant, indicative of acceptable fit. The goodness of fit (GFI) has a value of 0.903 which is acceptable, and adjusted goodness of fit (AGFI) has a value of 0.892 which is close to the acceptance value acceptable. The root mean square error (RMSEA) indicates 0.077, is good as it is below 0.08. Table 2 shows quality of public healthcare services model, it has a Chi-square value of 15.652 and degrees of freedom = 11, with ratio (1.423). It was failed to reject to model. This statistic supports that the differences of the predicted and actual matrices are non-significant, indicative of acceptable fit. The goodness of fit (GFI) has a value of 0.979 which is acceptable, and adjusted goodness of fit (AGFI) has a value of 0.946 which is also acceptable. The root mean square error (RMSEA) indicates 0.046, is very good as it is below 0.05.
Table 2. Goodness of fit result and conditions

<table>
<thead>
<tr>
<th>Goodness of fit indices</th>
<th>Results</th>
<th>Cut Off Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS Chi-Square</td>
<td>241.123</td>
<td>small is good</td>
<td>Approximately Good</td>
</tr>
<tr>
<td>Ratio</td>
<td>4.822</td>
<td>&lt; 5</td>
<td>Good</td>
</tr>
<tr>
<td>GFI</td>
<td>0.903</td>
<td>&gt; 0.90</td>
<td>Good</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.892</td>
<td>&gt; 0.90</td>
<td>Approximately Good</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.077</td>
<td>&lt; 0.08</td>
<td>Good</td>
</tr>
<tr>
<td>QPHS Chi-Square</td>
<td>15.652</td>
<td>small is good</td>
<td>Good</td>
</tr>
<tr>
<td>Ratio</td>
<td>1.423</td>
<td>&lt; 5</td>
<td>Good</td>
</tr>
<tr>
<td>GFI</td>
<td>0.979</td>
<td>&gt; 0.90</td>
<td>Good</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.946</td>
<td>&gt; 0.90</td>
<td>Good</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.046</td>
<td>&lt; 0.08</td>
<td>Good</td>
</tr>
</tbody>
</table>

(Overall) Model

The model is conceptualized to understand the relationship between SIS and QPHS. The result in Table 3 refer to the regression weight. It shows that system quality (SyQ) dimension was highest for strategic information system (SIS) towards quality of public healthcare services (QPHS) which is recorded 0.83 weight estimate value, whereas the regression weight for e-service quality (EsQ) was lowest for measuring (SIS) in such units which is recorded 0.18 weight estimate value. The standardized regression weight for the path linking exogenous latent variable SIS to endogenous latent variable QPHS was 0.67 which was found to be significant at a significance level of 0.05. Therefore, the alternative main hypothesis H1 of strategic information system positively impacting the quality of public healthcare services is supported.

Table 3. Regression Weights for Overall Model

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Regression Weight Estimate</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS to QPHS</td>
<td>0.67</td>
<td>0.002</td>
</tr>
<tr>
<td>SIS to InfQ</td>
<td>0.74</td>
<td>0.000</td>
</tr>
<tr>
<td>SIS to EsQ</td>
<td>0.18</td>
<td>0.041</td>
</tr>
<tr>
<td>SIS to SyQ</td>
<td>0.83</td>
<td>0.000</td>
</tr>
</tbody>
</table>

(Factor) Model

The model is conceptualized to understand the relationship between SIS and QPHS. According to the result shown in Table 4 the standardized regression weight for the path linking InfQ to QPHS was 0.243 which was found to be significant at a significance level of 0.05. Therefore, the alternative hypothesis H1a of InfQ positively impacting the QPHS is supported. Also the standardized regression weight for the path linking SyQ to QPHS was 0.771 which was found to be significant at a significance level of 0.05. Therefore, the alternative hypothesis H3a of SyQ positively impacting the QPHS is supported. In addition the standardized regression weight for the path linking EsQ to QPHS was 0.037 which was found to be not significant at a significance level of 0.05. Therefore, the alternative hypothesis H2a of EsQ positively impacting the QPHS is unsupported.
### Table 4 Regression Weights for factor Model

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>QoH</td>
<td>&lt;--- InfQ</td>
<td>0.243</td>
<td>0.126</td>
<td>1.932</td>
</tr>
<tr>
<td>QoH</td>
<td>&lt;--- SeQ</td>
<td>0.037</td>
<td>0.049</td>
<td>0.766</td>
</tr>
<tr>
<td>QoH</td>
<td>&lt;--- SyQ</td>
<td>0.771</td>
<td>0.117</td>
<td>6.610</td>
</tr>
<tr>
<td>q1</td>
<td>&lt;--- InfQ</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>q3</td>
<td>&lt;--- InfQ</td>
<td>0.518</td>
<td>0.240</td>
<td>2.154</td>
</tr>
<tr>
<td>q4</td>
<td>&lt;--- InfQ</td>
<td>1.906</td>
<td>0.449</td>
<td>4.244</td>
</tr>
<tr>
<td>q7</td>
<td>&lt;--- SeQ</td>
<td>0.951</td>
<td>0.094</td>
<td>10.104</td>
</tr>
<tr>
<td>q8</td>
<td>&lt;--- SeQ</td>
<td>0.840</td>
<td>0.097</td>
<td>8.689</td>
</tr>
<tr>
<td>q9</td>
<td>&lt;--- SeQ</td>
<td>0.842</td>
<td>0.105</td>
<td>8.025</td>
</tr>
<tr>
<td>q10</td>
<td>&lt;--- SeQ</td>
<td>1.224</td>
<td>0.096</td>
<td>12.813</td>
</tr>
<tr>
<td>q11</td>
<td>&lt;--- SyQ</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>q12</td>
<td>&lt;--- SyQ</td>
<td>1.380</td>
<td>0.146</td>
<td>9.447</td>
</tr>
<tr>
<td>q13</td>
<td>&lt;--- SyQ</td>
<td>1.116</td>
<td>0.149</td>
<td>7.476</td>
</tr>
<tr>
<td>q14</td>
<td>&lt;--- SyQ</td>
<td>0.933</td>
<td>0.144</td>
<td>6.494</td>
</tr>
<tr>
<td>q15</td>
<td>&lt;--- SyQ</td>
<td>1.018</td>
<td>0.108</td>
<td>9.423</td>
</tr>
<tr>
<td>q20</td>
<td>&lt;--- QoH</td>
<td>0.704</td>
<td>0.103</td>
<td>6.829</td>
</tr>
<tr>
<td>q19</td>
<td>&lt;--- QoH</td>
<td>0.612</td>
<td>0.099</td>
<td>6.170</td>
</tr>
<tr>
<td>q18</td>
<td>&lt;--- QoH</td>
<td>0.649</td>
<td>0.088</td>
<td>7.353</td>
</tr>
<tr>
<td>q17</td>
<td>&lt;--- QoH</td>
<td>0.546</td>
<td>0.100</td>
<td>5.463</td>
</tr>
<tr>
<td>q21</td>
<td>&lt;--- QoH</td>
<td>0.799</td>
<td>0.108</td>
<td>7.374</td>
</tr>
<tr>
<td>q22</td>
<td>&lt;--- QoH</td>
<td>1.022</td>
<td>0.120</td>
<td>8.497</td>
</tr>
<tr>
<td>q16</td>
<td>&lt;--- QoH</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>q6</td>
<td>&lt;--- SeQ</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION AND CONCLUSIONS**

Information systems are one of the structural changes that public institutions have adopted in recent times. One of the basic requirements of the information society is transparent and fast public administration. It is thought that such an administrative structure will be effective in service provision. Healthcare is one of the areas where the public sector allocates the most resources. In recent years, the public healthcare sector in Iraq has suffered from the conditions of the war on terror, which have affected the provision of logistical and financial capabilities. Quality of public healthcare services has become a national priority in almost all countries in the world. According to different health scholars SIS is one of the ways in which the quality of health care can be improved. An empirical study found a significant relationship between strategic information system and the quality of healthcare provided. And improving the quality of information systems improves the patient satisfaction. And the quality of SIS helps to monitor the performance of healthcare professionals, improves healthcare provided and provides a platform to base decisions.
Availability of strategic information and the quality of management of such information has perceived importance which affects both healthcare quality and the safety of the patient. According to study conducted in the U.K by (Luchenski, et al), majority of the patients and high number of members of the public in the U.K support the strategic information system; because of the perception that such technologies will improve the quality of strategic information system leading to improved quality of healthcare service.

The results of this study showed that the information quality have greatly affected the quality of public healthcare services, In this regard, literature stressed the importance of adopting information quality in high-risk industries such as healthcare. As they have an important role to play in providing quality care. As such, the result demonstrated the effect of system quality on quality of public healthcare services.

In turn, the results did not demonstrate any impact of e-service quality on quality of public healthcare services. This finding is contrary to the study of (Hafeez & Malak). The difference may be due to different field of study, As well as the fact that the healthcare sector in Iraq has not applied e-service so far.

In a summary, the results demonstrated there are impact for two key elements of strategic information system (information quality (InfQ), system quality (SyQ)) on improving quality of healthcare services.

Conflict of Interest : Author declared: None

Source of Funding: Self-funded

Ethical Clearance: The participants’ data were collected in accordance with the Helsinki declaration, and each participant was informed about the nature and the main objective of the study.

REFERENCES


The Analysis of Risk Factors Associated with Nutritional Status of Toddler in Posyandu of Beringin Village, Alalak Sub-District, Barito Kuala District

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ABSTRACT

Barito Kuala is one of the regencies in South Kalimantan with the highest prevalence of underweight with a percentage of 20.7%. In 2017, malnutrition occurred in Alalak District as many as 374 children under five (30.6%) with the highest nutritional status, namely in Beringin Village as many as 57 toddlers (16%). Research aim to explain the relationship between risk factors and nutritional status of children in the Posyandu of Beringin Village, Alalak Sub-District, Barito Kuala District. This study used an observational method with cross-sectional design. The sample was 98 respondents with proportional random sampling. Data were analyzed using chi square and Fisher exact test for bivariate, and logistic regression test for multivariate. The results showed that there was a relationship between maternal nutritional knowledge (p-value 0.043) and feeding practices (p-value 0.0001) with the nutritional status of children, while the gender factor (p-value 0.873), the age of the toddler (p-value 0.570), infectious disease (p-value 0.105), the last education of the mother (p-value 0.182), father’s last education (p-value 0.290), family income (p-value 0.790), and number of children (p-value 1.000) showed no relationship with nutritional status of children under five. Multivariate results showed that the most dominant feeding practice was related to p-value 0.001 and the PR value is 5.875 times the impact on nutritional status.

Keywords: Nutritional Status, Malnutrition, Risk Factors, Toddler.

INTRODUCTION

Problem nutrition in infants remains a challenge that must be addressed seriously, among which malnutrition.¹ The global prevalence of undernutrition in 2014 was 2.4%.² In 2013, the prevalence of malnutrition in children under five increased to 19.6%.³ South Kalimantan ranks 5th the highest malnutrition in Indonesia with a prevalence of 27.4%. Barito Kuala District is one of the contributors to the malnutrition (W/A<-2DS) highest.⁴ A report from the Barito Kuala Health Office, the highest incidence of malnutrition in Alalak Sub-District was 30.6%. The villages with the highest nutritional status in under five children are in the village of Beringin as much as 16%.

The causes of malnutrition in children under five are directly include inadequate intake of food as well as their accompanying infectious diseases. The indirect causes include family income, number of children, parenting, maternal education, and individual health services and environmental sanitation. The factors associated with under-five nutritional status are children’s characteristics (including food intake, age, and sex), parenting style and family characteristics (including maternal knowledge about nutrition and feeding practices), as well as community characteristics, demographics and social.⁵ ⁷

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MATERIALS AND METHOD

The research design was quantitative research with cross sectional. The population is all children under five in the Posyandu area in Beringin Village, Alalak Sub-District, Barito Kuala District. While the sample of 98 respondents obtained from the calculation using the lemeshow proportion difference test formula. The sampling technique uses proportional random sampling. Data were analyzed using chi square and Fisher exact test for bivariate, and logistic regression test for multivariate with 95% significance level.

RESULTS AND DISCUSSION

Bivariate Analysis

Table 1. The Bivariate Analysis of Variables

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Category</th>
<th>Nutritional Status</th>
<th>Total</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Malnutrition</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Gender</td>
<td>Male</td>
<td>16 (41.01%)</td>
<td>23 (59.0%)</td>
<td>39 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>22 (37.3%)</td>
<td>37 (62.7%)</td>
<td>59 (100%)</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>12-36 month</td>
<td>30 (41.1%)</td>
<td>43 (58.9%)</td>
<td>73 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37-60 month</td>
<td>8 (32.0%)</td>
<td>17 (68.0%)</td>
<td>25 (100%)</td>
</tr>
<tr>
<td>3</td>
<td>Infectious disease</td>
<td>Chronic</td>
<td>5 (71.4%)</td>
<td>2 (28.6%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute</td>
<td>33 (36.3%)</td>
<td>58 (63.7%)</td>
<td>91 (100%)</td>
</tr>
<tr>
<td>4</td>
<td>Last education of mother</td>
<td>Low</td>
<td>33 (42.9%)</td>
<td>44 (57.1%)</td>
<td>77 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>5 (23.8%)</td>
<td>16 (76.2%)</td>
<td>21 (100%)</td>
</tr>
<tr>
<td>5</td>
<td>Last education of father</td>
<td>Low</td>
<td>26 (35.1%)</td>
<td>48 (64.9%)</td>
<td>74 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>12 (50.0%)</td>
<td>12 (50.0%)</td>
<td>24 (100%)</td>
</tr>
<tr>
<td>6</td>
<td>Mother’s knowledge on nutrition</td>
<td>Lack</td>
<td>20 (52.6%)</td>
<td>18 (47.4%)</td>
<td>38 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>18 (30.0%)</td>
<td>42 (70.0%)</td>
<td>60 (100%)</td>
</tr>
<tr>
<td>7</td>
<td>Feeding practice</td>
<td>Lack</td>
<td>30 (57.7%)</td>
<td>22 (42.3%)</td>
<td>52 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>8 (17.4%)</td>
<td>38 (82.6%)</td>
<td>46 (100%)</td>
</tr>
<tr>
<td>8</td>
<td>Family income</td>
<td>Low</td>
<td>32 (40.0%)</td>
<td>48 (60.0%)</td>
<td>80 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>6 (33.3%)</td>
<td>12 (66.7%)</td>
<td>18 (100%)</td>
</tr>
<tr>
<td>9</td>
<td>Number of children</td>
<td>Not Ideal</td>
<td>8 (38.1%)</td>
<td>13 (61.9%)</td>
<td>21 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ideal</td>
<td>30 (39.0%)</td>
<td>47 (61.0%)</td>
<td>77 (100%)</td>
</tr>
</tbody>
</table>
Based on table 1, the variables of gender with the nutritional status of children using the Chi-Square test obtained p-value of 0.873. This indicates no relationship between gender and nutritional status of children, that caused that between the sexes men and women at the age of five depend on feeding practice given by the mother. If the mother did good feeding practice, the nutritional status of children will be good and vice versa. So that the sex factor influences are controlled by the practice of feeding from mothers in determining the nutritional status of children. There was no significant relationship between gender and nutritional status of children (p-value=1.557). Although the nutritional status is influenced by biological determinants which include sex, but it is not significant if the presence of other factors such as prakti k controlling feeding in influencing the nutritional status of children.7, 8

Analysis of age variables with nutritional status of children using Chi-Square test obtained p-value of 0.570 which means there is no relationship between age and nutritional status of children. This occurs because other factors such as feeding practice. Children aged 37-60 months can convey their wishes to parents about what foods they want to consume so that the practice of feeding parents determines the nutritional status of children. Likewise with a group of children aged 12-36 months, the role of maternal nutrition knowledge is needed in feeding the toddlers. Children under five with ages 12-36 months are passive groups so that the role of parents is needed in fulfilling the nutritional status of children under five. There is no relationship between age and nutritional status of children under five p-value>0.05 (sig 0.068).9, 10

Analysis of infectious disease variables with nutritional status of children using the Fisher's Exact Test obtained p-value of 0.105. This means there is no relationship between infectious diseases and nutritional status of children. Because only found toddlers with the most infectious diseases are acute types of diseases, such as acute respiate infection (ARI) and diarrhea. This type of acute disease does not last long (not chronic). In addition, if children under five are given good feeding practices, infectious diseases tend not to affect the nutritional status of children under five. The effects of infectious diseases on nutritional status in children vary, depending on the consumption patterns from parents, the kind of food that is able to consume the child and treatment efforts when the period of the disease. In line with There was no significant relationship between chronic infectious diseases and nutritional status in children under five, with a p-value of 0.289 (p>0.05).11, 12

Analysis of the variables of the last education level of mothers with nutritional status of children using the Chi-Square test obtained p-value of 0.182. This means that there is no relationship between the last level of education of the mother and the nutritional status of Bali, because mothers with the last low education level still have the same opportunity like the last educated mother to access information about her nutritional status through counseling activities at the Posyandu. This proved that mothers with low education found some who had good knowledge and pre-feeding skills to keep the nutritional status of children well. A high education does not necessarily guarantee good behavior related to maternal health and nutritional status of children. Mothers who have high or low education have an opportunity to get good information and knowledge to support their health behavior and nutritional status. Between education and nutritional status obtained p-value of 0.471 which means that there is no relationship between maternal education and nutritional status of children under five.13, 14

Variable analysis of the father’s last education level with nutritional status of children using the Chi Square test p-value obtained 0.290. This means there is no relationship between the level of education of the father and the nutritional status of children under five. The fact shows that the role of fathers is more work than related to the nutritional continuity of toddlers. Although the level of education of fathers determines the family income generated, not all families with fathers with low education have children with low nutritional status. The nutritional status of toddlers is determined more by mothers who have direct contact with toddlers in providing feeding practices according to their nutritional needs. The results of the study showed that father’s education was found to be the most with the basic category, namely 62 people (73.8%).15

Variable analysis of maternal nutrition knowledge with nutritional status of children using the Chi-Square test obtained p-value of 0.043. This means that there is a relationship between maternal nutritional knowledge and nutritional status of children. The facts show that knowledge underlies mothers to behave in providing food to their children. Mothers who have good knowledge about nutritional status, tend to be
more selective in feeding toddlers so that the nutritional status of children is well maintained. On the contrary, mothers who have less knowledge tend not to pay attention to how the practice of feeding on toddlers in accordance with nutritional requirements so that children are vulnerable to experiencing nutritional problems such as malnutrition. Knowledge about nutrition is needed to overcome problems arising from nutritional consumption. Mother as the person responsible for food consumption for families, mothers must have knowledge about nutrition through both formal and informal education. The results of Pearson chi-square statistical test showed that there was a relationship between maternal knowledge about child nutrition and nutritional status of children under five years of age in the working area of Rejosari Community Health Center in Sail Village, Tenayan Raya City, Pekanbaru (p value of 0.004<α 0.05).  

Analysis of the variables of feeding practices with nutritional status of children using Chi-Square test obtained p-value of 0.0001. This means that there is a relationship between the practice of feeding and the nutritional status of children in the Posyandu of Beringin Village, Alalak Sub-District, Barito Kuala District. Because, there is feeding practice given by mothers determining the nutritional status of children. Mother giving good feeding practices have a chance to have a child with a normal nutritional status than mothers who are not good in feeding. Food consumed by children under five depends on the feeding practices carried out by people old, especially mother.

Analysis of family income variables with nutritional status of children under five using the Chi-Square test obtained p-value of 0.790. This means that there is no relationship between family income and nutritional status of children. The fact shows that family income in the study area has more temporary employment and has income below the Barito Kuala District Minimum Wage, which is <2,454,671. However, this is not a factor related to the nutritional status of children. There is no relationship between the economic level and nutritional status in the Air Tawar Barat Urban Village in Padang with p-value of 0.868.

Variable analysis of the number of children with nutritional status of children under five using the Chi Square test obtained p-value of 1.000. This means there is no relationship between the number of children with nutritional status of children under five. Facts show that there is a person’s ability old meets food needs along with the increasing number of children in the family. Families who have a number of children are not ideal, on average from families who have high income so that they are able to meet the nutritional adequacy of their family members. Poor families will more easily meet their food needs if their family members are small. There was no significant relationship between the number of children in the family and the nutritional status of children.  

**Multivariate Analysis**

![Figure 1. The Multivariate Analysis of Variables](image)

Based on Figure 1, it is known that the practice of feeding with a p-value of 0.001 and the prevalence ratio (PR) value is the highest, namely 5.875 times the effect on the nutritional status of children. This means practice feeding is the most dominant risk factors associated with the nutritional status of children in Posyandu Beringin, Alalak Sub-District, Barito Kuala District.

Maternal nutritional knowledge on multivariate analysis showed a non-significant relationship with nutritional status of children although the bivariate analysis showed a significant relationship. This is due to the influence of other variables that are stronger, considering the influential variables are analyzed all at once so that the possibility of being controlled by variables has a greater influence on the practice of feeding.

Despite the knowledge of good maternal nutrition but do not carry out daily feeding practice good for babies it will lead to nutritional problems such as lack of nutrition. Conversely, if the knowledge of maternal nutrition is under-fives, the practice of feeding the toddlers is used done well in the family will support a good nutritional status. This is because behavioral sharing in enabling good feeding is not only based on good nutrition knowledge but other factors as support such as habits applied in the family.
CONCLUSION

Based on the research that has been done at the Posyandu of Beringin Village, Alalak Sub-District, Barito Kuala District, it can be concluded that there is a relationship between maternal nutritional knowledge (p-value 0.043) and feeding practices (p-value 0.0001) with nutritional status of children, while gender factors (p-value 0.873), toddler age (p-value 0.570), infectious disease (p-value 0.105), mother’s last education (p-value 0.182), father’s last education (p-value 0.290), family income (p-value 0.790) and the number of children (p-value 1.000) showed no correlation with the nutritional status of children, and the most dominant factor of feeding practice was related (p-value 0.001) and the PR value was 5.875 times the effect on the nutritional status of children.

Ethical Clearance: This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study, we followed the guidelines from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research title, purpose, participants’ right, confidentiality, and signature.

Source Funding: This study was done by self-funding from the authors.

Conflict of Interest: The authors declare that they have no conflict interests.

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17. Lestari, Hartati. The Influence of Toddler Feeding and Mother’s Knowledge on Toddler Nutritional Status in Meteseh Village, Tembalang District, Semarang City. Health Articles. 2015.


The Findings of Escherichia Coli in Drinking Water with Reverse Transcriptase Polymerase Chain Reaction Method at 16S RNA Gene

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ABSTRACT

Drinking water is the fundamental needs of urban communities. Emerging drinking water refilled station (DWRS) causing decreased in water quality so required the existence of quality monitoring efforts. RT-PCR technique could detect the presence of Escherichia coli in drinking water. The RT-PCR method is superior in accuracy, efficiency, and specificity. This research aims to analyze the presence of Escherichia coli as an indicator of the quality of refilled drinking water with the technique of RT-PCR target 16s RNA. The sample in this study was ten drinking water refilled station with the total sample 30 samples measured in the inlet, outlet and output. The results of RT-PCR in Mariso district, obtained RNA Band in the gene 16S RNA at position 723-bp in the sample a. 13. While in Panakukkang district captured RNA Band in the gene 16S RNA at position 723-bp on sample B. 11; B. 12; B. 13. Conclusions, Genomic RNA template by RT-PCR can be used to detect bacteria Escherichia coli in drinking water more quickly and accurately than conventional methods.

Keywords: Escherichia Coli, 16S-RNA, drinking water, RT-PCR, Culture

INTRODUCTION

Infection from drinking water caused 13 million people died annually, 2 million of them are infants and children. Consume water contaminated by pathogenic microorganisms may cause various gastrointestinal diseases.1 Increasing for drinking water needs make growing drinking water refilled station (DWRS). 2

Contamination in drinking water produced by a variety of physical hazards, chemical, biological, radioactive, equipment, poor sanitation, and hygiene.3,4 Increased quality of water, waste disposal, and personal hygiene are essential to reduce contamination.1 The number of drinking water refilled station in South Sulawesi province in 2015 were 1.017, qualified 591 and 426 unqualified. 5

There are 28,908 diarrhea cases in Makassar city in 2013, Incidence Rate 21.3‰. One of the causes of diarrheal diseases were drinking water contaminated with bacteria.5

Coli’s most probable number (MPN) is considered to be less accurate in detecting certain types of bacteria in the water.6 RT-PCR techniques can be used to identify life bacteria.7 RT-PCR have more accuracy, efficiency, and specificity.8,9 Kandou et al., found 8.33% samples of bottled drinking water and 25% of drinking water samples polluted by Escherichia coli serotype O157: H7. The source of the contamination comes from unstandardized processing.10

RT-PCR can detect bacteria in different concentrations. Primary EF II applications decreased false-positive results compared to 16S primary rRNAs. The hydrophobic FHLP filter has a higher ability to absorb bacteria compared to HAWB hydrophilic filters. Hence the use of hydrophobic filters will increase the sensitivity of RT-PCR.11,12 This research aims to analyze the presence of bacterial pathogens Escherichia coli as an indicator of the quality of drinking water refill with

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the technique of Reverse Transcriptase - PCR (RT-PCR) and target 16s RNA.

MATERIALS AND METHOD

This is an observational study to identify the presence of *Escherichia coli* as an indicator of the quality of refilled drinking water with RT-PCR 16SRNA target. Samples obtained from 5 drinking water refill station in Mariso and Panakukang district in Makassar city. Each example obtained from the inlet, outlet and drinking water at the level of the consumer (outputs), a total of 30 samples.

DNA Extraction

100 ml sample was added 900 ml solution of L6 (Lysis buffer) then incubated for 24 hours, put on a shaker for 2 hours then added 20 μ l suspension. This mix of vortices and placed on a shaker 10 rpm for 10 minutes. Vortex and centrifuge at 12,000 rpm for 15 minutes scoop out the supernatant. Reserving ten μl of supernatant fluid in the tube. Washed twice with 1 ml solution of L1 (Washing buffer), centrifuge and vortex for 15 seconds then discard the supernatant. Wash two times with 1 ml of 70% ethanol and once with acetone. Discard supernatant acetone, let the tube open and incubate at a temperature of 56°C in the incubator for 10 minutes. Add 60 μ l of TE-elution buffer, vortex well then the tube incubation at a temperature of 56°C for 10 minutes. After that, the centrifuge for 30 seconds at 12,000 rpm. Move 50 μ l of supernatant into a new vial then keep at a temperature of 20°C until ready to be processed by PCR technique.13

Amplification of DNA by PCR

Mixture PCR samples in PCR tubes. Every 16.9 μl of sterile water, 2 μl 10 mm *deoxynucleotide* triphosphate mixture 1 μl 50 mM Mgso4, 2.5 μL of 10 X amplification buffer 0.5 μ 1 10 μ M Forward primer and 0.5 μ 1 10 μ M reverse primer, 0.1 μ l (0.25 μ U/L) of Taq DNA polymerase and sterile water is added until the final volume was 22.5 μ l. The prepared vial that has filled each of the 2.5 μ l sample DNA. Each tube in a reaction mixture PCR content as much as 22.5 μ l. after that the tubes are filled by using PCR machines (hybrid, Ashford, UK) as many as 40 cycles each cycle consisted of denaturation at 94°C for 1 min, annealing temperature 57°C for 1 minute 15 seconds and the extension at a temperature of 72°C for 30 seconds. The final extension at 72°C for one night.14

Detection of PCR products

Each five μ l amplification products mixed with two μ l solution. Put in 1.5% agarose gel wells that are submerged in a tank containing a buffer Tris-EDTA acetic acid. Also included a marker (DNA λ/Hind III) into the wells of agarose to know the size of the PCR product, then DNA electrophoresis runs for 1 hour with the constant voltage temperatures 75 volts. After 1 hour, electrophoresis stopped and gels lifted and observed under ultraviolet light (UV). The results obtained in the form of a black ribbon pattern DNA (DNA bands) which shows the number and different patterns.

Data Analysis

Results of detection of PCR with electrophoresis are analyzed based on whether or not there are pieces in DNA that are formed and data presented in a descriptive by using tables and images. Sequence and position of the Nucleotide Primer, 16SRNA Gene; Forward 5 ‘ CGA GCG GAC GTC GGG TGA GT3 ‘ (From 81) Reverse 5 ‘ ACA TCG TCG ACG GCG TTT TGG A3 ‘ (From 786). Size (bp) 723 Access number EF6209.

RESULTS

Analysis of a physical parameter DWRS In Mariso Makassar City including the temperature and TDS showed in table 1. Analysis of the Chemical parameters includes pH, iron, and chloride. Results on pH samples; A.11 (8.18), A.21 (8.01), A.31 7.09, A.41 (7.46), A.51 (7.7). Iron found in the samples; A.11 and A.51 about 0.1 mg/l. The highest chloride found in the sample A.51 100mg/l, while the lowest was on samples; A. 22, A. 23; A. 31; A. 32; A. 33 at 6 mg/l. Cultures found almost all of the samples examined were positive MPN coli.
Table 1. Physical and chemical parameters DWRS In Mariso Makassar City

<table>
<thead>
<tr>
<th>Code station</th>
<th>Sample Code</th>
<th>Source</th>
<th>The temperature *C</th>
<th>TDS (mg/l)</th>
<th>PH</th>
<th>Iron (mg/l)</th>
<th>Chloride (mg/l)</th>
<th>Culture MPNcoli</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. 1.1</td>
<td>Inlet</td>
<td>27.5</td>
<td>107.8</td>
<td>8.18</td>
<td>0.1</td>
<td>37</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 1.2</td>
<td>Outlet</td>
<td>27.8</td>
<td>102.3</td>
<td>8.22</td>
<td>0</td>
<td>10</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 1.3</td>
<td>Outlet</td>
<td>31.5</td>
<td>117.8</td>
<td>7.11</td>
<td>0</td>
<td>10</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>A. 2.1</td>
<td>Inlet</td>
<td>27.9</td>
<td>99.6</td>
<td>8.01</td>
<td>0</td>
<td>8</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 2.2</td>
<td>Outlet</td>
<td>27.5</td>
<td>96.8</td>
<td>8.18</td>
<td>0</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 2.3</td>
<td>Outlet</td>
<td>29.5</td>
<td>107.5</td>
<td>7.19</td>
<td>0</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>A. 3.1</td>
<td>Inlet</td>
<td>27.0</td>
<td>27.0</td>
<td>7.09</td>
<td>0</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 3.2</td>
<td>Outlet</td>
<td>27.5</td>
<td>111.2</td>
<td>8.18</td>
<td>0</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>A. 3.3</td>
<td>Outlet</td>
<td>27.5</td>
<td>87.5</td>
<td>8.18</td>
<td>0</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>A. 4.1</td>
<td>Inlet</td>
<td>29.2</td>
<td>29.2</td>
<td>7.46</td>
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<td>12</td>
<td>+</td>
</tr>
<tr>
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<td>A. 4.2</td>
<td>Outlet</td>
<td>28.6</td>
<td>38.4</td>
<td>7.64</td>
<td>0</td>
<td>10</td>
<td>+</td>
</tr>
<tr>
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<td>A. 4.3</td>
<td>Outlet</td>
<td>30.2</td>
<td>107.5</td>
<td>7.5</td>
<td>0</td>
<td>10</td>
<td>+</td>
</tr>
<tr>
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<td>A. 5.1</td>
<td>Inlet</td>
<td>28.4</td>
<td>28.4</td>
<td>7.7</td>
<td>0.1</td>
<td>100</td>
<td>+</td>
</tr>
<tr>
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<td>A. 5.2</td>
<td>Outlet</td>
<td>32.2</td>
<td>45.5</td>
<td>7.11</td>
<td>0</td>
<td>95</td>
<td>+</td>
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<tr>
<td></td>
<td>A. 5.3</td>
<td>Outlet</td>
<td>29.2</td>
<td>260</td>
<td>7.77</td>
<td>0</td>
<td>95</td>
<td>+</td>
</tr>
</tbody>
</table>

Examination of a physical parameter in Panakukang Makassar City the temperature of the inlet, outlet and output of each sample shown in table 2. Analysis of the Chemical parameters includes pH, iron, and chloride. The results of the investigation of the PH at sample b. 1.1 (7.1), b. 2.1 (8.9), b. 3.1 (7.4), b. 4.1 (7.8), b. 5.1 (8). Iron and chloride were not found. Examination of Coli MPN method using culture retrieved sample code B. 1.1, B.1.2 and B. 1.3 as well as sample B. 5.1; B. 5.2 and B.5.3 negative MPN coli.

Tabel 2. Analysis of physical and chemical Parameters DWRS Station In Panakukang

<table>
<thead>
<tr>
<th>Code station</th>
<th>Sample Code</th>
<th>Source</th>
<th>The temperature of the *C</th>
<th>TDS (mg/l)</th>
<th>Ph</th>
<th>Iron (mg/l)</th>
<th>Chloride (mg/l)</th>
<th>Coli MPN Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B. 1.1</td>
<td>Inlet</td>
<td>30.8</td>
<td>55.7</td>
<td>7.1</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>B. 1.2</td>
<td>Outlet</td>
<td>30</td>
<td>30</td>
<td>7.7</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>B. 1.3</td>
<td>Outlet</td>
<td>31</td>
<td>31</td>
<td>8.5</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>B. 2.1</td>
<td>Inlet</td>
<td>30.1</td>
<td>53.7</td>
<td>8.9</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>B. 2.2</td>
<td>Outlet</td>
<td>29</td>
<td>29</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>B. 2.3</td>
<td>Outlet</td>
<td>30.4</td>
<td>28.4</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
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<td>75.4</td>
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<td>29.4</td>
<td>29.4</td>
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<td>Outlet</td>
<td>31.2</td>
<td>28.2</td>
<td>7.4</td>
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<td>0</td>
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<td>4</td>
<td>B. 4.1</td>
<td>Inlet</td>
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<td>37.14</td>
<td>7.8</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>B. 4.2</td>
<td>Outlet</td>
<td>27.5</td>
<td>27.5</td>
<td>7.8</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>B. 4.3</td>
<td>Outlet</td>
<td>31.2</td>
<td>25.2</td>
<td>7.5</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>B. 5.1</td>
<td>Inlet</td>
<td>30.1</td>
<td>30.8</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>B. 5.2</td>
<td>Outlet</td>
<td>29.2</td>
<td>29.2</td>
<td>8.5</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>B. 5.3</td>
<td>Outlet</td>
<td>28</td>
<td>24</td>
<td>8.5</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>
Analysis RT-PCR in the gene 16S RNA found in the samples a. 13 (positive Escherichia Coli) while the other samples undetected, as shown in table 3.

Table 3. Results of RT-PCR Escherichia coli 16S RNA-gene on DWRS in district Mariso

<table>
<thead>
<tr>
<th>Slot</th>
<th>Sample Code</th>
<th>RT-PCR Results</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marker</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A. 1.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>A. 1.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A. 1.3</td>
<td>(+)</td>
<td>Detected</td>
</tr>
<tr>
<td>5</td>
<td>A. 2.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A. 2.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A. 2.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A. 3.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>A. 3.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>A. 3.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>A. 4.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>A. 4.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>A. 4.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>A. 5.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>A. 5.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>A.5.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Negative Control</td>
<td>(-)</td>
<td></td>
</tr>
</tbody>
</table>

Analysis RT-PCR in the gene 16S RNA found in the samples B. 21, B. 22 and B. 33 (Positive Escherichia Coli) while the other samples undetected, as shown in table 4.

Table 4. Results of RT-PCR Escherichia coli 16S RNA-gene on DWRS in district Panakukakng

<table>
<thead>
<tr>
<th>Slot</th>
<th>Sample Code</th>
<th>RT-PCR Results</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marker</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B. 1.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>B. 1.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>B. 1.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>B. 2.1</td>
<td>(+)</td>
<td>Detected</td>
</tr>
<tr>
<td>6</td>
<td>B. 2.2</td>
<td>(+)</td>
<td>Detected</td>
</tr>
<tr>
<td>7</td>
<td>B. 2.3</td>
<td>(+)</td>
<td>Detected</td>
</tr>
<tr>
<td>8</td>
<td>B. 3.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>B. 3.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>B. 3.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>B. 4.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B. 4.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>B. 4.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>B. 5.1</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>B. 5.2</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>B. 5.3</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Positive Control</td>
<td>(-)</td>
<td></td>
</tr>
</tbody>
</table>
Electrophoresis in Mariso district obtained RNA Band in the gene 16S RNA at position 723-bp in the sample A. 13. While in Panakukakng obtained on sample B. 11; B. 12; B. 13.

**DISCUSSION**

Escherichia coli contamination in drinking water is caused by the unstandardized process. Chlorine can kill Escherichia Coli by destructive process of transport and respiration of membrane cells. The Escherichia Coli serotype O157: H7 strain G can still survive on the low chlorine concentrations.\(^\text{15}\)

The prolonged contact with the raw water the higher the chance microbes overgrowth. The contact time between water with UV light for at least four seconds, and the time of connection between the water and the ozone at least four minutes. The Faster water flows rate than the specified time, the effectiveness of UV as harmful bacteria exterminator will decrease.\(^\text{16}\)

Observation using *electron microscopy scanning* indicated that *Escherichia coli* serotype O157: H7 sticking and multiply on the walls of the container and survive for more than 300 days. Poor hygiene of the bottles can make the formation of biofilms.\(^\text{17}\) The sequence selected as targets for amplification, resulting in 234 bp and bp PCR product 115.\(^\text{12}\) Biofilm cells more durable against anti-microbial materials, the physical condition of such extreme heat, so the contamination by these cells can spread the disease through food and water.\(^\text{10}\)

The hygiene dispenser is generally less noticed by the consumer. The method of a repeating dispenser reset without cleaning the inside of the container allowing the growth of microbes. The risk of microbial contamination can occur either in normal-temperature, cold or heat because germs can grow at the cold, regular or hot temperatures.\(^\text{18}\) The impact of the microbial contamination in the dispenser can potentially cause diarrhea. Contamination of drinking water can occur at the level of the producers, sellers or consumers. Drinkable water should be qualified bacteriologically or chemically. One indicator for potable water is the amount of bacteria present. Health Director-General requirements limit bacterial impurities in food and drink is a number TPC < 100/ml sample.

Identification of Escherichia Coli conventionally using biochemical reactions test and inoculation, it requiring quite a long time, the biochemical tests is hard to do, and are not accurate. This is because the bacterial colony alleged *Escherichia coli* in selective media and deferential media is often not pure and mixed with other *Enterobacteriaceae* bacteria.

Identification of *Escherichia coli* using conventional methods requires 5-6 days, PCR method takes two days (48 hours). This is in line with the research conducted by the Infallible Radji et al.\(^\text{19}\), conventional methods take six days while the PCR method only takes 48 hours. The direct PCR methods can detect the presence of *Escherichia coli* in samples without isolation of colonies of bacteria first.\(^\text{20}\) Thus the PCR method is more accurate and faster than conventional methods.

**CONCLUSION**

Genomic RNA template by RT-PCR can be used to detect bacteria Escherichia coli in drinking water refills more quickly and accurately than conventional methods.

**Ethical Clearance-** Taken from Hasanuddin University Ethics Committee, approval number: 195 / H4.8.4.5.31 / PP36-KOMETIK / 2017.

**Source of Funding -** Self-funding

**Conflict of Interest**- The author declares no conflict interest regard this research

**REFERENCES**

5. Dinkes Kota Makassar. Profil data kesehatan Kota


Development of Organizational Effectiveness Indicators for Delivery Departments at the Secondary Level Hospitals affiliated to the Thai Ministry of Public Health

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ABSTRACT

Background: The indicators for organizational effectiveness are significantly for organization development in competition situation which rapidly change.

Aim: To develop organizational effectiveness indicators for delivery departments at the secondary level hospitals using quantitative method.

Method: The samples of this study were 226 head nurses of delivery units in the 113 secondary level hospitals affiliated to the Ministry of Public Health in Thailand. The scale development process of organizational effectiveness indicators was using eight steps of scale development by DeVillis. The content validity testing by seven experts with content validity index (CVI) was 0.96 and item-objective congruence Index (IOC) was a range of 0.80-1.00. The reliability of the questionnaire in the form of Cronbach’s Alpha Coefficient was 0.94. The data were analyzed using confirmatory factor analysis.

Results: The components of organizational effectiveness indicators in delivery departments at the secondary level hospitals affiliated to the Ministry of Public Health consisted of four components with 24 indicators with the value of factor loading of each component between 0.69-0.93 at P-value <05. The sequence of components according to value by factor loading from highest to lowest value were as follows: (1) internal process (factor loading=0.93; \( \bar{X} = 4.20, SD = 0.42 \)), (2) strategic constituencies satisfaction (factor loading=0.77; \( \bar{X} = 4.18, SD = 0.43 \)), (3) goal accomplishment (factor loading=0.75; \( \bar{X} = 4.11, SD = 0.47 \)), and (4) resource acquisition (factor loading=0.69; \( \bar{X} = 4.07, SD = 0.49 \)). The confirmatory factor analysis model of organizational effectiveness of delivery departments was congruent with the empirical data (CMIN/df=1.46, GFI=1.00, AGFI=0.97, RMSEA=0.04). This model accounted for 58.70% of the variance in the organizational effectiveness in delivery departments at the secondary level hospitals affiliated to the Ministry of Public Health.

Conclusion: This study demonstrated the development of organizational effectiveness indicators for delivery departments which will be an enable the organizational effectiveness training for division head nurses of delivery departments, and can be used to measure organizational effectiveness of delivery departments affiliated to the Ministry of Public Health.

Keywords: Organizational Effectiveness; Delivery Departments; Secondary level hospitals.

INTRODUCTION

According to the national strategic plan policy of Ministry of Public Health of Thailand identified that it will be public health 4.0 which supports the future of urban society, including trade and investment enhancement, technological advancement, especially reducing access to health systems. Health organization should be adapt strategic planning of excellence (1) promotion and
prevention excellence; (2) service excellence; (3) people excellence; and (4) governance excellence. The health organizations should provide quality and safety services, including clients and health service providers satisfaction. The organizational effectiveness is the most important factors, it makes the organization survive in a changing of socioeconomic environment. The evaluation of organizational effectiveness is necessary as perceiving the level of organizational effectiveness in order to understand the way organizations achieve their goals and changing the strategic planning appropriately. The nursing organizations, the delivery units’ organizational effectiveness is important as it leads to enhancing the quality of nursing services, higher customer satisfaction, and higher employee retention, profitability, and the creation of competitive advantages for hospitals and finally business success.

At present, the organizational effectiveness indicators have not been studied in delivery units which have many risk and emergency situations causing maternal and neonatal mortality rate including medical prosecution. From a literature review of the organizational effectiveness concepts, Kinicki and Kreitner’s organizational effectiveness concept identified the components of organizational effectiveness consisted of four components: (1) goal accomplishment; (2) resource acquisition; (3) internal process; and (4) strategic constituencies satisfaction. To achieve organizational effectiveness, business leaders need to focus on aligning and engaging staff, the human resource management systems, and the structure and capabilities related to organizational strategies, its results presented in higher financial performance. To fill the gaps of the organizational effectiveness studies in the field of delivery units, the aim of this study was to develop organizational effectiveness indicators for delivery departments at the secondary level hospitals.

METHOD

Population and Sample

The population consisted of 330 head nurses of delivery units from the secondary level hospitals affiliated to the ministry of public health from 165 hospitals from the 12 networks of Health Service Network in Thailand. The sample size was determined with a ratio of 10 respondents per parameter which was considered as the most appropriate. A stratified random sampling was used by sampling from the Health Service Network’s 12 networks, and simple random sampling and sample size calculation resulted in 226 head nurses of delivery units from 113 community hospitals.

Scale Development

The researcher developed and tested the quality of organizational effectiveness indicators of delivery units based on concept’s Kinicki and Kreitner, along with Burn and Grove’s method of research instrument development with eight steps as follows:

1. Identifying the concepts of the variables

Selecting organizational effectiveness concepts that could be used in the research and building an understanding of organizational effectiveness, so the concept’s Kinicki and Kreitner was used in this study. These were composed of four components as (1) goal accomplishment; (2) resource acquisition; (3) internal process; and (4) strategic constituencies satisfaction

2. Defining the concept

Defining each component of organizational effectiveness of delivery units which were (1) goal accomplishment was achieving the delivery unit performance; (2) resource acquisition was the providing of resources and experts for professional nurses; (3) internal process was planning, guideline for quality nursing service enhancement, concerning safety and critical service management; and (4) strategic constituencies satisfaction was job satisfaction enhancement of nurses staff and stakeholders and good relationship with each other.

3. Designing of a scale

Designing a scale to be used to consider each indicator for measuring organizational effectiveness for delivery units of the secondary level hospitals affiliated to the Thai Ministry of Public Health. The scale must correspond with the objective of the research and content of the items. A measurement scale was designed in the form of a 5-point Rating scales that would be used to consider each of the indicators for measuring organizational effectiveness. The scale had labels ranging from “most real”, “real”, “not sure”, “unreal” and “most unreal”.
4. Seeking item review

Seeking item was reviewed from a team of subject matter experts with knowledge and experience in organizational effectiveness of delivery units, four expertises in the area, and with three experts in the field of survey instrument development. The content validity index (CVI) and item-objective congruence index (IOC) were analyzed.

5. Conducting preliminary item tryouts

Conducting a preliminary pretest of the items with 30 head nurses of delivery units of the secondary level hospitals was affiliated to the Ministry of Public Health of Thailand. Data were used to calculate indicators reliability by using Cronbach’s Alpha Coefficient to obtain internal consistency of the overall scale, each component’s reliability, item-item correlations, item-total correlations, and alpha-if-item deleted reliability coefficients.

6. Performing field tests

The sample group in this study was composed of 226 head nurses of delivery units based on the scale development concept of DeVillis.

7. Conducting construct validity studies

The data was collected from head nurses of delivery units. The construct validity was using confirmatory factor analysis.

8. Evaluating the reliability of the scale

The reliability of the scale was analyzed in the form of Cronbach’s Alpha Coefficient.

Data Analysis

The data were analyzed using the package computer programs: (1) descriptive statistics were used to determine means and standard deviations; (2) confirmatory factor analysis was performed to test for the goodness of fit of the structural model of the factors; weights were assigned to constructing the indicators and empirical data to determine the weights of the main variables used in constructing the indicators; and (3) Cronbach’s Alpha Coefficient provided a measure of the internal consistency of the scale and describes the extent to which all the items in a test measure the same construct.

FINDINGS

Two hundred twenty-six head nurses of delivery units responded to answer the self-administered questionnaire. Most of the participants were female (98.20%) and a half were aged 46–55 years (45.60%). Most of them graduated with bachelor degrees (85.40%) and having experiences in delivery management within a range of 5–10 years (37.10%).

The research found the 24 indicators of four components of delivery-unit effectiveness as follows: (1) goal accomplishment (4 indicators); (2) resource acquisition (5 indicators); (3) internal process (7 indicators); and (4) strategic constituencies satisfaction (8 indicators). The measurement scale was designed in the form of a 5-point Rating scales that would be used to consider each of the indicators for measuring the delivery units’ organizational effectiveness. The scale had labels ranging from “most real”, “real”, “not sure”, “unreal” and “most unreal”. Item content for the scales was selected that corresponded to the objective being studied by the researcher and the indicators.

Item reviews obtained a content validity index (CVI) of 0.96 and item-Objective Congruence Index (IOC) with a range of 0.80-1.00 from seven subject matter experts. The preliminary tryout of the items was conducted with 30 head nurses of delivery units. Data were used to calculate the instrument’s components reliability by using Cronbach’s Alpha Coefficient. The internal consistency of the goal accomplishment component was 0.84; the resource acquisition component was 0.81; the internal process component was 0.92; strategic constituencies satisfaction component was 0.90 and the overall reliability was 0.94. The corrected item-total correlation was at 0.41-0.82. The item-item correlation matrix was at 0.30-0.70 for more than 50% of the correlations, and the alpha if item was deleted ranged from 0.93-0.95, showing that the scale’s internal consistency value was at a satisfactory level.

Researchers were able to collect data from 226 completed forms, and to conduct statistical data analysis by performing confirmatory factor analysis. Pursuant to the confirmatory factor analysis found the organizational effectiveness model to be consistent with the evidence-based data as a perfect fit by considering CMIN/df < 3, GFI > 0.90, AGFI > 0.90, RMSEA <0.05. This shows that the main hypothesis was accepted.
The research model fitted well to empirical data. The result of factors score was found that the most of four important components was administrative potential of organizational effectiveness for the delivery units by internal process (factor loading=0.93; $\overline{X}=4.20$, SD=0.42), strategic constituencies satisfaction (factor loading=0.77; $\overline{X}=4.18$, SD=0.43), goal accomplishment (factor loading=0.75; $\overline{X}=4.11$, SD=0.47), and resource acquisition (factor loading=0.69; $\overline{X}=4.07$, SD=0.49), respectively (Figure 1, Table 1). The causal model has congruence with the empirical data (CMIN/df=1.46, GFI=1.00, AGFI=0.97, RMSEA=0.04). The model accounted for 58.70% of the variance in the organizational effectiveness in delivery departments (Figure 1).

Table 1: The organizational effectiveness indicators for the delivery units of the secondary level hospital affiliated to the Thai Ministry of Public Health

<table>
<thead>
<tr>
<th>Component name</th>
<th>$\overline{X}$</th>
<th>SD</th>
<th>Component name</th>
<th>$\overline{X}$</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Goal accomplishment</td>
<td>4.11</td>
<td>0.47</td>
<td>II. Resource acquisition</td>
<td>4.07</td>
<td>0.49</td>
</tr>
<tr>
<td>1. Reviewing the outcomes of the work</td>
<td>4.16</td>
<td>0.58</td>
<td>5. Having a monitor system for medical supplies in a state of readiness.</td>
<td>4.29</td>
<td>0.64</td>
</tr>
<tr>
<td>2. Reviewing the progress of the operations</td>
<td>4.14</td>
<td>0.55</td>
<td>6. Allocating the budget for quality and adequacy of medical supplies and materials.</td>
<td>4.16</td>
<td>0.66</td>
</tr>
<tr>
<td>3. Organizing an organization for policy implementation each units.</td>
<td>4.13</td>
<td>0.60</td>
<td>7. Defining the qualifications of personnel in accordance with the job.</td>
<td>4.08</td>
<td>0.54</td>
</tr>
<tr>
<td>4. Having the goals achievement.</td>
<td>4.01</td>
<td>0.49</td>
<td>8. Allocating the budget for professional nurses to be trained and develop their expertise in the job.</td>
<td>4.01</td>
<td>0.78</td>
</tr>
<tr>
<td>9. Providing nursing staff workload appropriate for the proportion of clients.</td>
<td></td>
<td></td>
<td>17. All level of nursing staff must be involved in the operation of the delivery unit.</td>
<td>4.38</td>
<td>0.57</td>
</tr>
<tr>
<td>III. Internal process</td>
<td>4.20</td>
<td>0.42</td>
<td>IV. Strategic constituencies satisfaction</td>
<td>4.18</td>
<td>0.43</td>
</tr>
<tr>
<td>10. Using nursing process as a tool</td>
<td>4.33</td>
<td>0.55</td>
<td>17. All level of nursing staff must be involved in the operation of the delivery unit.</td>
<td>4.38</td>
<td>0.57</td>
</tr>
<tr>
<td>11. Having a standardized practice</td>
<td>4.28</td>
<td>0.52</td>
<td>18. Nursing staff have good relationship each other</td>
<td>4.22</td>
<td>0.59</td>
</tr>
<tr>
<td>12. Readiness for taking emergency situations</td>
<td>4.22</td>
<td>0.53</td>
<td>19. Nursing staff have good relationship with clients.</td>
<td>4.21</td>
<td>0.52</td>
</tr>
<tr>
<td>13. Having effective risk management system</td>
<td>4.16</td>
<td>0.56</td>
<td>20. Having a good teamwork.</td>
<td>4.20</td>
<td>0.59</td>
</tr>
<tr>
<td>14. Providing operational plan consistent with the strategy and vision of the nursing organization</td>
<td>4.19</td>
<td>0.55</td>
<td>21. The personnel should be recognition from clients.</td>
<td>4.18</td>
<td>0.61</td>
</tr>
<tr>
<td>15. Operating according to the plan</td>
<td>4.10</td>
<td>0.53</td>
<td>22. The level of clients’ satisfaction meet the goals of the delivery units.</td>
<td>4.17</td>
<td>0.56</td>
</tr>
<tr>
<td>16. Having effective communication systems</td>
<td>4.09</td>
<td>0.53</td>
<td>23. Stakeholders are satisfied with the delivery units’ performance.</td>
<td>4.06</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24. Staff are satisfied in the job.</td>
<td>3.99</td>
<td>0.54</td>
</tr>
</tbody>
</table>
DISCUSSION

The indicators for organizational effectiveness in delivery departments composed of four components and 24 indicators. Concerning, the goal accomplishment is the most widely used effectiveness criterion for organizations. Key organizational results or outputs are compared with previously stated goals or objectives. Effectiveness, relative to the criterion of goal accomplishment, was gauged by how well the organization meets or exceeds its goals. The organizations as delivery departments should be organized to facilitate policy implementation in each delivery unit, reviews the progress of the operations, and the results of the work. From the study Kamolbutr found that the general hospital affiliated to Thai Ministry of Public Health was high level of organizational effectiveness in the aspect of goal accomplishment component.

Resource acquisition, this second criterion was defined as the qualifications of nursing staff related to nursing tasks, appropriated nursing workload, allocating the budget for nursing training, allocating the budget for quality and adequacy of medical supplies and materials, and monitor system for medical supplies were similar to the study from Khaewpordtook and Ratchukul found that the level of organizational effectiveness in general hospitals and each component of its were in the high levels. Human resources, budget and materials were potential components for the organization’s operations. The medical devices were readiness and the monitor system was efficient maintenance.

Internal process was referred as the “healthy systems” approach. An organization will be a healthy system if it has effective communication systems, employee loyalty and commitment, job satisfaction, and trust prevail. The delivery units should be three priorities on using nursing process as a tool, having standardized practices, and readiness for taking emergency situations whereas the previous research studies in general units put priorities on the operating with efficient management and planning, having effective communication and risk management.

Lastly, the present study found that strategic constituencies satisfaction was stakeholder satisfaction. To achieve satisfactions, the head of the delivery units should put priorities on nursing staff involvement, interpersonal relationship of nursing staff each other and with clients, and a good teamwork whereas Khaewpordtook and Ratchukul who studied in general units found that the component of strategic constituencies satisfaction was in the first rank of components with high level.

CONCLUSION AND IMPLEMENTATION

The organizational effectiveness components and indicators of delivery departments at the secondary level hospitals affiliated to the Thai Ministry of Public Health was being construct validity, accuracy, and consistency with Kinicki and Kreitner’s organizational effectiveness concept. The head of delivery units should put priority according to the sequence of factor loading of each component from highest to lowest value being (1) internal process; (2) strategic constituency satisfaction; (3) goal accomplishment; and (4) resource acquisition. This study found the new knowledge of the organizational effectiveness indicators for delivery departments, the head nurses of delivery units should be trained to use this organizational effectiveness measurement for delivery departments affiliated to the Ministry of Public Health.

Source of Funding: A part of the study was supported by Christian University of Thailand in 2018.

Conflict of Interest: The authors have no conflicts of interest.

Ethical Clearance: Ethical Clearance was taken from the ethical committee of Christian University of Thailand (registration no. N.38/2559) on June 3, 2017. The protected samplings were obtained as personal information and ethical concerns which includes informed consent and maintaining confidentiality. They had the right to cancel participation in the study at any time without any impact on participants.

REFERENCES


Incidence of Cleft Lip and Palate in Karbala Province

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Department of Dentistry(Orthodontics), Ibn Hyyan University College, Karbala City, Iraq

ABSTRACT

Introduction: Cleft palate and/or cleft lip (CP/CL) are the most common congenital anomalies in the maxillofacial and oral region. This study was conducted to obtain the accurate estimates of the frequency and other epidemiological features of oral clefts in Karbala province.

Materials and Method: In this cross-sectional study that conducted at Maxillofacial Unit, Karbala Teaching Hospital as the main hospital in Karbala city from the period of January 2015 till March 2018. 7321 cases were randomly selected by using a simple random method from hospital documented files of infants. Clinical and demographic factors relating to diagnosed cases, including Birth order Prevalence, Baby weight prevalence and Prevalence of Family history as other congenital anomalies were recorded for analysis.

Results: The incidence rate of CL/P in Karbala province was 1.77 per 1,000 live births. 53.8, and 46.2 were the percentage of bilateral and unilateral cleft cases respectively. Oral clefts were found to be more common in male than female births (male/female ratio=6/4). The first child incidence rate (41.67) was the highest from the birth order prevalence in comparing with others birth prevalence. Regarding weight prevalence as the important parameter in cleft lip/palate prevalence children with the underweight were the highest in cleft lip/plate prevalence.

Conclusion: In conclusion, this study and other studies show that the incidence of cleft deformities in different populations depend on genetic factors, ethnicity and environmental conditions these causes have important roles in frequently conflicting results. So integrating genetic analysis into epidemiologic studies and environmental pollution as a predisposing factor for CL/P incidence will be necessary for future studies.

Keywords: Cleft lip, Cleft palate, Epidemiology, Incidence, Karbala Province, Iraq.

OBJECTIVE

Although there have been a few published epidemiological investigations concerning oral clefts in Iraq\(^1\). There is a lack of information about the prevalence of cleft lip and palate in Karbala city. Considering the importance of obtaining accurate estimates of the frequency and other epidemiological features of oral clefts, this study was conducted in order to assess the incidence and related factors of CL/P among live births in Karbala province, Iraq.

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INTRODUCTION

Definition and description: A cleft is an opening or fissure may occur in lip as Cleft lip (cheiloschisis) or in palate called cleft palate (palatoschisis) can also occur together as cleft lip and palate (CL/P)\(^2\). Cleft palate and/or cleft lip (CP/CL) are the most common congenital anomalies in the maxillofacial and oral region and exhibit a multi-factorial etiology, including genetic and environmental factors\(^3,4\). Facial appearance and functions disorder such as hearing, phonation, mastication, deglutition, and ventilation are altered by this malformation\(^5\). Other parts of the face such as ears, eyes, nose, cheeks, and forehead could be affected by cleft. Paul Tessier in 1976 described 15 lines of cleft which called Tessier clefts\(^6\). Cleft lip is partial or incomplete cleft formed in the top of the lip or it continues into the
nose as a complete cleft. Cleft (CL/P) can occur as a one-sided (unilateral) or two-sided (bilateral).

**Embryology:** In facial morphogenesis, neural crest cells migrate into the facial region, where they form the skeletal and connective tissue and all dental tissues except the enamel. Vascular endothelium and muscle are of mesodermal origin. The upper lip is derived from medial nasal and maxillary processes. Failure of merging between the medial nasal and maxillary processes at 5 weeks’ gestation, on one or both sides, results in cleft lip. Cleft can occur in numerous ways:

1. Defective growth of palatal shelves
2. Lack of contact between shelves
3. Rupture after fusion of shelves.
4. Failure of the shelves to attain a horizontal position

The secondary palate develops from the right and left palatal processes. Fusion of palatal shelves begins at 8 weeks’ gestation and continues usually until 12 weeks’ gestation. One hypothesis is that a threshold is noted beyond which delayed movement of palatal shelves does not allow closure to take place, and this results in a cleft palate.

**Etiology**

Cleft lip and cleft palate as congenital abnormalities have linked to maternal hypoxia. Other environmental factors that have been studied include, maternal diet, pesticide exposure, anticonvulsant drugs, alcohol drinking; cigarette smoking; exposure of nitrate compounds, organic solvents, heavy metals and retinoids intake; which are members of the vitamin A family; and illegal drugs intake like cocaine, crack cocaine, heroin, etc.

In the US and in other countries, many epidemiologic studies of (CL/P) that include the difference in risk of orofacial clefts development have been discussed on the incidence of cleft lip, cleft palate, and cleft lip and palate. Their results explain a wide variation in the developing clefts risk within and among races. In addition, there is an epidemiological different in clefts cases that associated and non-associated with malformations. Generally, the incidence of CL/P is estimated to be between 0.8 and 1.7 cases per 1,000 live births. Internationally, during the period 2000 to 2005, the overall prevalence of cleft lip with or without cleft palate was 9.92 per 10,000 live births. Most of the epidemiological studies on CL/P have been conducted in the Asian, Europe and USA. In Iran, the overall incidence of oral clefts was reported to be 1.03 per 1,000 births. Several studies have demonstrated that the incidence is highest among Asians, followed by Caucasians, and lowest in people of African descent. The clefts incidence may be affected by racial, geographic and socioeconomic factors. Approximately 1 out of 1000 born children have a cleft lip and/or a cleft palate. The live births Prevalence rates of Cleft lip with or without Cleft Palate (CL +/- P) and cleft Palate alone (CP) varies within different ethnic groups. The highest prevalence rates for (CL +/- P) are reported for Native Americans and Asians. Africans have the lowest prevalence rates (Kirby et al., 2000), (Forrester & Merz, 2004). World Health Organization shows the epidemiology of typical orofacial Clefts through mention the registered cumulative data of different countries.

**Diagnosis**

Cleft lip can be easily diagnosed by performing ultrasonography in the second trimester of pregnancy when the position of the fetal face is located correctly.

**MATERIALS AND METHOD**

**Materials**

The selected samples are newly born babies. Electronic Baby Scale BW-SCB1 (use to measure the babies weight), and 12-megapixel I phone mobile camera were used as Instrument in this research.

**Methods**

This is a descriptive study that conducted at Maxillofacial Unit, Karbala Teaching Hospital as the main hospital in Karbala city, from the period of January 2015 till March 2018. Iraqi children who born in Karbala province were the samples that depended on this study. 7321 cases were randomly selected by using a simple random method from hospital documented files of infants. The newly born were clinically examined with aid of a pediatric physician. Extra-oral, intraoral examination and recording the information in case sheet that filled with patients families together were included in this study. The demographic data of case sheet were name, gender, weight, date of birth, address, residence of baby family, and any congenital anomalies that
related to the type of cleft lip/ cleft palate according to Millard classification 1976. Finally, the collected data were analyzed statistically by using Excel of the Microsoft Office Professional Plus 2013.

**RESULTS**

From the total of 7321 cases that shown in table 1 Oral clefts were found to be more common in male than female births (male/female ratio=6/4). Twelve children with CL/P were born during study period. The incidence rate of CL/P was 1.77 per 1,000 live births. 53.8, and 46.2 were the percentage of bilateral and unilateral cleft cases respectively.

**Table 1 life and death cleft cases**

<table>
<thead>
<tr>
<th>cases</th>
<th>males</th>
<th>females</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>non cleft cases</td>
<td>3122</td>
<td>4187</td>
<td>7309</td>
</tr>
<tr>
<td>cleft life cases</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>cleft dead cases</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>total</td>
<td>3129</td>
<td>4192</td>
<td>7321</td>
</tr>
</tbody>
</table>

Distribution of newborns which affected with CL/P with the bilateral cleft palate (CL/P) was the most prevalent type of cleft (58%) as shown in table 2 followed by unilateral cleft lip (42%).

**Table 2 Cleft types in life cases**

<table>
<thead>
<tr>
<th>Cleft life cases</th>
<th>Unilateral</th>
<th>Bilateral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Cleft</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>CL</td>
<td>3</td>
<td>60</td>
<td>1</td>
</tr>
<tr>
<td>CP</td>
<td>1</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>CLP</td>
<td>1</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>100</td>
<td>7</td>
</tr>
</tbody>
</table>

CL: cleft lip; CP: cleft palate; CLP: cleft lip and palate.

In table 3 it’s easy to see that, the percentage of the first child was the highest 41.67 from the birth order prevalence in comparing with others birth prevalence.

**Table 3: Birth order Prevalence**

<table>
<thead>
<tr>
<th>Birth order Prevalence</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
<th>fourth &amp; above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cleft palate</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cleft lip and palate</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Percentage</td>
<td>41.67</td>
<td>16.67</td>
<td>16.67</td>
<td>25.00</td>
</tr>
</tbody>
</table>

In discussing the baby weight prevalence as the important parameter in cleft lip/palate prevalence and according to the data in table 4 underweight, average weight and overweight were highly respectively in cleft lip/plate prevalence.
Table 4 Baby weight prevalence

<table>
<thead>
<tr>
<th>Baby weight prevalence</th>
<th>cleft newborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>under weight</td>
<td>6</td>
</tr>
<tr>
<td>average weight</td>
<td>5</td>
</tr>
<tr>
<td>over weight</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
<tr>
<td>Percentage</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 5 Prevalence of Family history of clefts

<table>
<thead>
<tr>
<th>Prevalence of Family history of clefts</th>
<th>present</th>
<th>non present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip and palate</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Percentage</td>
<td>33.33</td>
<td>66.67</td>
</tr>
</tbody>
</table>

DISCUSSION

This cross-sectional study was carried out to explore the epidemiological investigations concerning oral clefts in Karbala province, Iraq. The overall incidence of CL/P was found to be 1.7 per 1,000 live births. The previous studies in Iraq show that the incidence rate of CL/P was 1.2 per 1,000 live births in Al Anbar province. During 2008, another research in Erbil City mention the prevalence of cleft lip and palate was 2 per 1000 births. Internationally, the overall incidence of CL/P was 1.9 per 1,000 live births in Iran 1.94 per 1,000 in the Philippines 19, 1.91 per 1,000 in Pakistan 19, 1.81 per 1,000 in Korea 21, 1.53 per 1,000 in Scotland 22, 1.39 per 1,000 in Jordan 23, 0.77 per 1,000 in the USA 13 and 0.34 per 1,000 in Africa 24. It seems that the incidence of CL/P in Iraq is similar to that in Iran, Pakistan and some Asian countries, but higher than Scotland, Jordan, USA and Africa. Environmental factors and genetic susceptibility as variations may be the cause of this difference in the rate of CL/P among different populations and that very clear in this study results. The present study showed that male predominates in all types of clefts that similar in other studies results in Iraq 23 as well as in others countries (19). Regarding the cleft types, Cleft lip and palate was the most common type that shown in infected cases and these results agree with the most previous studies that registered in the WHO database 16. In addition, there is agreement with others studies that show the incidence rate of CL/P in Iraq may reflect an increasing with environmental effect due to wars pollutions as a direct causes 1, 19 or indirect causes like hypoxia during pregnancy period 17, 26.

CONCLUSION

The overall prevalence for congenital cleft deformities in Karbala province was 1.7 per 1,000 live births, this result close to the other studies findings in Iraq and surrounding countries. Regarding the prevalence of cleft deformities in different populations, genetic factors, ethnicity and environmental conditions have important roles in frequently conflicting results. So integrating genetic analysis into epidemiologic studies will be necessary for future studies.

Ethical Clearance- This research is approved by the Ethical committee that held in Ibn Hyyan Medical University.

Source of Funding- Self sponsor

Conflict of Interest - Nil

REFERENCES


Isolation and Identification of Aggregatibacter Actinomyctetemcomitans Bacteria by Culturing and Polymerase Chain Reaction Methods in Patients with Chronic Periodontitis

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ABSTRACT

Aggregatibacter actinomycetemcomitans bacterium is a portion of the normal flora in healthy persons however it involves in the pathogenesis of chronic periodontitis. Present study aimed to isolate Aggregatibacter actinomycetemcomitans bacteria and their cytolethal distending toxins from chronic periodontitis patients. Forty chronic periodontitis patients were incorporated in the study. From 2 sites with the deepest probing pocket depth, subgingival biofilm samples were gathered and transferred to laboratory for isolation of Aggregatibacter actinomycetemcomitans bacteria by routine culture method. Also molecular isolation of Aggregatibacter actinomycetemcomitans bacteria and cytolethal distending toxins using polymerase chain reaction technique were performed. Statistical analysis revealed that Aggregatibacter actinomycetemcomitans amplicons present in (75%) of the patients and cytolethal distending toxins amplicons present in (70 %) of the patients. Also amplicons of cytolethal distending toxin A were found in (35%) of the patients while amplicons of cytolethal distending toxin B were found in (55%) of the patients and amplicons of cytolethal distending toxin C were found in (65%) of the patients. As a conclusion, Aggregatibacter actinomycetemcomitans bacteria and their virulent factors have a considerable role in chronic periodontitis progression.

Keywords: Aggregatibacter actinomycetemcomitans, subgingival biofilm, polymerase chain reaction.

INTRODUCTION

Aggregatibacter actinomycetemcomitans (Aa) represents a facultative anaerobic gram-negative, cocobacillus bacterium and it is considered as an element of oral flora (1). Actinobacillus actinomycetemcomitans is a member of the genus Actinobacillus (2). Aggregatibacter actinomycetemcomitans bacterium is a main causative agent of some types of periodontitis (3). Chronic periodontitis is an infectious disease that cause a damage to the teeth-supporting tissues as a result of a complex group of inflammatory conditions (4).

Aggregatibacter actinomycetemcomitans has been associated to a several infectious diseases, including osteomyelitis, lung and brain abscesses, subcutaneous abscesses, septic endocarditis, cardiovascular diseases (5,6) and chronic periodontal diseases (7–9). An association between periodontal diseases and Aggregatibacter actinomycetemcomitans had been revealed by several studies (10–12).

Aggregatibacter actinomycetemcomitans bacteria have several virulence factors such as lipopolysaccharides (LPS), bacteriocins, adhesins, leukotoxin (Ltx) and cytolethal distending toxin (Cdt).

The CdtS are formed by numerous bacteria such as Aggregatibacter actinomycetemcomitans, Shigella dysenteriae, Campylobacter sp., Helicobacter sp., Escherichia coli, Salmonella enterica, and Haemophilus ducreyi (13–19).

Three genes encode Cdt, including Cdt A, Cdt B, and Cdt C (20–23). The most important function of the Cdt is its capacity to disrupt cell cycle by arresting the cells in G2 phase (24). It has been shown that CdtB represents
The establishment of DNA-damage-dependent checkpoint leads to blockage of cell cycle progression (26) that eventually leads to apoptosis (27). The expected role of CdtC and CdtA is to assist in the entry of CdtB into the cell. Cytolethal distending toxin (A) has a carbohydrate-binding domain and it localize to the plasma membrane (28).

**MATERIAL AND METHOD**

The participants of current study were selected from patients visiting Periodontics Department in Collage of Dentistry – University of Babylon. Forty chronic periodontitis patients with the age ranged (30 – 60) years were incorporated in present study, all patients suffering from generalized chronic periodontitis as the criteria identified by American Academy of Periodontology (29).

Participants in the study should have no less than twenty natural teeth and have a good medical health. Exclusion criteria include: periodontal therapy twelve months before beginning of the study, antibiotic therapy during six months before examination, pregnancy and breast-feeding.

**Clinical procedures**

Patients of the study received a total -periodontal assessment to measure plaque index (PI) (30), gingival index (GI) (31) and bleeding on probing (BOP) (32). Also, clinical attachment loss (CAL) and probing pocket depth (PPD) were calculated from 6 surfaces of all teeth using Michigan O probe with Willams markings.

**Microbial sampling**

For each patient, a pooled subgingival samples were gathered from 2 sites with the deepest PPD. After removing of suprangingival biofilm from chosen sites, the latter were dried and secluded with cotton pellets. From every sites, subgingival biofilms were gathered using sterilized curettes and a sterile paper points that entered to base of the pocket and left for thirty seconds (33), then placed in tube containing Brain Heart Infusion broth. Samples were transfer to laboratory for isolation and detection of studied bacteria by routine culture method which was done by using selective media and anaerobic condition, also molecular isolation of A. actinomycetemcomitans bacteria and Cdts using polymerase chain reaction (PCR) technique were performed.

**Bacterial detection by culturing**

The anaerobic incubation of the samples spread on blood agar for 3-4 days. Presence of A. actinomycetemcomitans was determined by culturing and biochemical test. The cultivation performed on enriched selective media that used for the isolation and possible documentation of A. actinomycetemcomitans (34).

**Detection of Aa by PCR**

By using particular primers for Aggregatibacter actinomycetemcomitans and Cdts (35), the PCR method was done following the protocol described by Cortelli et al. (36).

After bacterial DNA extraction from the clinical samples, PCR was performed to detect positive samples using specific primers for the 16S ribosomal DNA gene (35). By using electrophoresis with Agarose gel (1.5%) stained by ethidium bromide (0.5 mg/ml), amplified products were analyzed.

**RESULTS**

The variables of present study were statistically analyzed by Statistical Process for Social Science (SPSS edition 20) by percentage and mean. The mean ages of the patients included in the present study was (47.98±7.16), also 55% of the patients were from male gender. Smokers patients represents 40% and the average number of the teeth presents in the mouth for all patients was (23.48±2.88) as shown in table 1. Means of clinical periodontal parameters include (1.81, 1.92, 52.38, 4.75 and 2.90) for PI, GI, BOP, PPD and CAL respectively as revealed in table 2.

**Table 1: Demographic criteria of the patients.**

<table>
<thead>
<tr>
<th>Demographic criteria</th>
<th>Age (Mean ± SD)</th>
<th>Gender Number (percentage)</th>
<th>Smoking status Number (percentage)</th>
<th>Number of teeth (Mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47.98±7.16</td>
<td>F =18(45%)</td>
<td>S=16(40%)</td>
<td>23.48±2.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M = 22(55%)</td>
<td>NS= 24 (60%)</td>
<td></td>
</tr>
</tbody>
</table>
Results of current study showed that *A. actinomycetemcomitans* bacteria were found in 16 (40%) patients using culturing method as shown in figure (1). Using PCR technique, *A. actinomycetemcomitans* amplicons were found in 30 (75%) patients and Cdt amplicons were found in 28 (70%) patients. Also Cdt A amplicons were found in 14 (35%) patients while Cdt B amplicons were found in 22 (55%) patients and Cdt C amplicons were found in 26 (65%) patients.

**DISCUSSION**

In present study *A. actinomycetemcomitans* bacteria were found in 40% and 75% of the patients using culturing and PCR techniques respectively. In a previous study, Colombo *et al.* (37) suggested that different genotypes of *A. actinomycetemcomitans* might be present in high levels in periodontal health or chronic periodontitis.

Important virulence factor of *A. actinomycetemcomitans*, Cdt, blocks cell cycle progression in T lymphocytes and epithelial cells. The present study succeed in detection of Cdt A, Cdt B and Cdt C genes in (35%), (55%) and (65%) of the patients respectively.

In previous study (85%) of Cdt gene polymorphism has been detected in periodontitis patients (38). Prevalence of Cdt is extremely variable, forty three of fifty strains from chronic periodontitis patients were positive for all Cdt genes (39). Other study showed that only 12% of the diseased sites had the Cdt genes (40), while Fabris *et al.* revealed that thirty nine of forty patients were positive for Cdt genes (41).

*Aggregatibacter actinomycetemcomitans* Cdt may cause imbalance in the periodontal connective tissue remodeling, by excessive bone resorption caused by over-stimulated osteoclast. It has been shown that *A.actinomycetecomitans* Cdt is sufficient to downregulate Osteoprotegerin (OPG)expression and to provoke the receptor activator of nuclear- factor kappa B ligand (RANKL) upregulation in periodontal cells and gingival fibroblasts (42).

As well as, *A.actinomyceteocomitans* Cdt disrupt development of human CD4+ and CD8+ T lymphocytes (43-46), also peripheral blood mononuclear cells attacked
by *A. actinomycetemcomitans* Cdt capable to secrete a high numbers of pro-inflammatory cytokines and interleukins (IL), such as Interferon Gamma (IFN-γ), IL-8, IL-6 and IL-1β (47). It is believable that *A. actinomycetemcomitans* Cdt cause an innate immune response stimulation and increase in the secretion of a particular cytokines, that aggravate inflammation, reduce T cell activity and provide an appropriate environment for bacterial propagation.

**CONCLUSION**

As a conclusion, *Aggregatibacter actinomycetemcomitans* bacteria and their virulent factors have a considerable function in the evolution of chronic periodontitis.

**Ethical Clearance:** All participants received learned consent to join in current study, the study was accepted by Ethics team of Collage of Dentistry / Babylon University.

**Source of Funding:** Self funding.

**Conflict of Interest:** No conflict of interest in current study.

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Inhibition of Propolis and Trigona spp’s honey towards Methicilin-Resistant Staphylococcus aureus and Vancomycin-Resistant Staphylococcus aureus

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ABSTRACT

Propolis and Trigona spp honey have functioned as anticancer, antiviral, antifungal and antibiotic. Isolates of Staphylococcus aureus resistant to Methicillin and Vancomycin found in the surgical treatment room and ICU of Ratu Zalecha Hospital Martapura. The purpose of this research was to determine the inhibitory zone of MRSA, VRSA to the propolis extract and honey of Trigona spp at the concentration of 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml. Also to know the concentration of the propolis extract and honey of Trigona spp in inhibiting the growth of MRSA, VRSA. The type of this research was true experimental with the design of Pretest-Posttest With Control Group Design. The study was conducted from April 2015 to June 2015 in Banjarbaru, South Kalimantan Indonesia. The objects of research are propolis and honey of Trigona spp hives in the Barabai area. The dependent variable was the inhibition zone of MRSA and VRSA in Hinton Muller media containing ethanol extract of propolis and honey of Trigona spp in some different concentrations measured from the formed diameter of inhibition zone. Data were analyzed by One Way ANOVA test and Kruskal-Wallis test at 95% confidence level. The results of the research showed that there were differences in MRSA and VRSA inhibition zone against various concentrations of Trigona spp honey. The strength of Trigona spp honey which was in inhibiting the growth of MRSA was 1000 mg/ml concentration with a diameter of 25.2 mm. VRSA at 1000 mg/ml concentration with a diameter of 26.6 mm. The strength of Trigona spp propolis extract which is useful in inhibiting the growth of MRSA is at 1000 mg/ml concentration with a diameter of 17.8 mm. VRSA at 1000 mg/ml concentration with a diameter of 16.4 mm.

Keywords: Propolis; Honey; Trigona spp; Staphylococcus aureus; Resistant

INTRODUCTION

The case of Methicilin-Resistant Staphylococcus Aureus (MRSA) in 1961 was found in England while in the USA was discovered in 19681. In Asia, the prevalence of infection of MRSA reaches 70%. While in Indonesia in 2006 the incidence is 25.5%. The first clinical isolate of Vancomycin-Resistant Staphylococcus aureus (VRSA) reported in the USA in 20022. In Medical College and Hospital, Midnapore, West Bengal, India recovered from 100 isolates of Staphylococcus aureus strains to 70% into MRSA, 54.3% as (VRSA), and 54.3% for both MRSA and VRSA3. At the Teaching Hospital, in Sari, Iran of Staphylococcus aureus isolates were 31.31% and 16.1%, indicating MRSA is vancomycin-intermediate Staphylococcus aureus (VISA)4. Hospital Khartoum, Sudan found 41% of MRSA, 12% VISA5 MRSA in poultry samples in Serdang, Malaysia was found 9 out of 30 isolates studied. The spread of pathogens and not only in hospitals but can also spread in poultry6.

In Indonesia, research of Vancomycin Resistant Staphylococcus Aureus (VRSA) found in 10 out of 64 isolates (15,6 mg/ml) and the stethoscope membrane in Margono Soekarjo hospital, Purwokerto7. A study on steteskop at a regional hospital in South Kalimantan also showed the presence of Staphylococcus aureus8. The strain of Staphylococcus aureus which is resistant towards Methicilin and Vancomycin found in the surgery room and ICU at RSUD Ratu Zalecha Martapura9.
One of the natural substances that was believed empirically has a lot of benefits and relatively safe is Propolis and honey from the bee. Various bee species produce propolis for self-defense. Propolis mostly used to cure various disease in the past last year\textsuperscript{10}. The type of bee beside Apis spp is Trigona spp, this bee produces honey than other and rarely farmed. The estimate contains propolis from this species is more than Apis spp\textsuperscript{11}.

Propolis has some benefits as anticancer, antivirus, antifungal and antibiotics\textsuperscript{11}. Research about the advantages of Trigona sp’s propolis from Kabupaten Bulukumba, South Sulawesi can inhibit the S. mutant growth. In vitro, research of Agustina\textsuperscript{12} shows the propolis extract from a bee in Malang can give an impact and inhibit the positive gram bacteria Staphylococcus epidermidis growth in a concentration 60 mg/ml and negative gram bacteria Pseudomonas aeruginosa growth in concentration 70 mg/ml. This research about the effectiveness of Propolis and Trigona spp hone bee from south Kalimantan antibacterial effect has proven that have resistivity towards Salmonella typhi and Staphylococcus aureus\textsuperscript{13}.

The aim of this research was to determine the inhibitory zone of MRSA, VRSA to the propolis extract and honey of Trigona spp at the concentration of 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml. Also to know the effective concentration of the propolis extract and honey of Trigona spp in inhibiting the growth of MRSA, VRSA.

**MATERIALS AND METHOD**

The type of research that used is True Experiment Method with Posttest only control design, which is having a resistivity test for Propolis extract and Trigona spp honey in a concentration 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml. The object in this research is Propolis and Honey from Trigona spp beehive from Barabai.

Independent variable in this research is Propolis extract and Trigona spp honey bee with a concentration 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml. The dependent variable in this research is resistivity of MRSA and VRSA in Muller Hinton media (Merck) which contain the ethanol extract of propolis and Trigona spp honey bee in some variant concentration which measured from the diameters of the resistivity that form.

About 20 grams of Propolis extracted with 200 ml ethanol 70% using maceration technique in 3 days filtered with filter paper and the propolis filtrate concentrated which evaporated the ethanol in 50°C using a water bath, until obtaining the concentrated extract. This thick propolis extract being added with Propylene glycol with the same weight. This concentration 1000 mg/ml will be diluted using sterile aqua dest to obtain a concentration 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml. It also should be done with bee materials. Antimicrobial test for Propolis and bee using a diffusion method well technique. Measure the diameters of the transparent circle in mm using a ruler around the well which contain material test to determine the resistivity of Propolis/Trigona spp honey bee towards bacteria and retested in 5 times\textsuperscript{12}.

**RESULTS AND DISCUSSION**

Result of Antimicrobial Test for Honey and Propolis Trigona spp

Antimicrobial test for honey and propolis extract Trigona spp towards isolate MRSA and VRSA shows the variation diameters of inhibition. Inhibition data of honey and propolis extract shows in table I-4.

**Table 1. Inhibition zone honey Trigona spp towards MRSA, VRSA**

<table>
<thead>
<tr>
<th>Concentration Honey Trigona spp</th>
<th>Inhibition Zone Honey Trigona spp (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MRSA</td>
</tr>
<tr>
<td></td>
<td>Rep 1</td>
</tr>
<tr>
<td>200mg/ml</td>
<td>0</td>
</tr>
<tr>
<td>400mg/ml</td>
<td>9</td>
</tr>
<tr>
<td>600mg/ml</td>
<td>15</td>
</tr>
<tr>
<td>800mg/ml</td>
<td>17</td>
</tr>
<tr>
<td>1000mg/ml</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>VRSA</td>
</tr>
<tr>
<td></td>
<td>Rep 1</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Rep = Repetition</td>
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</tr>
</tbody>
</table>
Table 2. Inhibition zone Propolis Extract *Trigona spp* towards MRSA, VRSA

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Inhibition Zone Propolis Extract <em>Trigona spp</em> (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MRSA</td>
</tr>
<tr>
<td>200mg/ml</td>
<td>8</td>
</tr>
<tr>
<td>400mg/ml</td>
<td>10</td>
</tr>
<tr>
<td>600mg/ml</td>
<td>12</td>
</tr>
<tr>
<td>800mg/ml</td>
<td>16</td>
</tr>
<tr>
<td>1000mg/ml</td>
<td>18</td>
</tr>
</tbody>
</table>

Rep = Repetition

Table 3. Inhibition Honey and Propolis Extract *Trigona spp* towards MRSA, VRSA

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Isolate MRSA</th>
<th>Propolis</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>200mg/ml</td>
<td>N = 5</td>
<td></td>
<td>8,4</td>
<td>0,245</td>
</tr>
<tr>
<td></td>
<td>Isolate VRSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propolis</td>
<td>10,8</td>
<td>0,2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honey</td>
<td>1,6</td>
<td>1,600</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Isolate MRSA</th>
<th>Propolis</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>400mg/ml</td>
<td>N = 5</td>
<td></td>
<td>10,2</td>
<td>0,374</td>
</tr>
<tr>
<td></td>
<td>Isolate VRSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propolis</td>
<td>12,2</td>
<td>0,200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honey</td>
<td>14</td>
<td>1,00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Isolate MRSA</th>
<th>Propolis</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>600mg/ml</td>
<td>N = 5</td>
<td></td>
<td>13,2</td>
<td>0,374</td>
</tr>
<tr>
<td></td>
<td>Isolate VRSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propolis</td>
<td>13,4</td>
<td>0,245</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honey</td>
<td>20,2</td>
<td>0,97</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Isolate MRSA</th>
<th>Propolis</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>800mg/ml</td>
<td>N = 5</td>
<td></td>
<td>15,2</td>
<td>0,200</td>
</tr>
<tr>
<td></td>
<td>Isolate VRSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propolis</td>
<td>15,4</td>
<td>0,245</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honey</td>
<td>24</td>
<td>0,632</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Isolate MRSA</th>
<th>Propolis</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000mg/ml</td>
<td>N = 5</td>
<td></td>
<td>17,8</td>
<td>0,200</td>
</tr>
<tr>
<td></td>
<td>Isolate VRSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propolis</td>
<td>16,4</td>
<td>0,245</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Honey</td>
<td>26,6</td>
<td>0,51</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. The Result Statistic Test Inhibition of Honey and Propolis Extract *Trigona* spp towards MRSA, VRSA

<table>
<thead>
<tr>
<th>Subject</th>
<th>Propolis</th>
<th>Honey</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MRSA</td>
<td>VRSA</td>
</tr>
<tr>
<td>Kontrol</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200mg/ml</td>
<td>8,4</td>
<td>10,8</td>
</tr>
<tr>
<td>N=5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400mg/ml</td>
<td>10,2</td>
<td>12,2</td>
</tr>
<tr>
<td>N=5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600mg/ml</td>
<td>13,2</td>
<td>13,4</td>
</tr>
<tr>
<td>N=5</td>
<td>0,00*</td>
<td>0,00*</td>
</tr>
<tr>
<td>800mg/ml</td>
<td>15,2</td>
<td>15,4</td>
</tr>
<tr>
<td>N=5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000mg/ml</td>
<td>17,8</td>
<td>16,4</td>
</tr>
<tr>
<td>N=5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a* Anova Test  
*b* Kruskal Wallis Test  
*<0,05* there is the significant different

The antibacterial mechanism in honey according to Suganda\(^1\)\(^4\) affected to a high level of Glucose and Fructose in honey, the acidity of honey and also hydrogen peroxide composition. According to Hamad\(^1\)\(^5\), the formation of glucose and fructose in honey through the osmotic process can cause dehydration to bacteria cell since a lot of water comes out and in this situation, the bacteria can quickly become lysis. The high acidity level of honey with pH 3.2-4.5 can cause the bacteria cell metabolism process to become slower when the compounds that bacteria need for a living are unavailable therefore it can cause the cell lysis easily.

According to Sulaiman\(^1\)\(^6\) the composition of hydrogen peroxide which is cytotoxic with the free radical formation that comes out will destroy the bacteria cell structure including the cell wall and cell membrane, this thing also can make the bacteria cell lysis so that it can decrease the bacterial growth.

The study result of Hijriah et al.\(^1\)\(^7\), shows that the Minimum Inhibit Concentration (MIC) *Trigona* spp honey bee towards Staphylococcus aureus in concentration 37.5 mg/ml and Minimum Bactericidal Concentration (MBC) in concentration 50 mg/ml. Results of research on *Trigona* carbonaria honey bee towards Staphylococcus aureus with minimum bactericidal concentrations 1.2-1.8 mg/mL\(^1\)\(^8\). The study of MRSA towards honey already done by Molan P.C\(^1\)\(^9\) and shows that honey has antimicrobial activity towards MRSA.

Extraction process for propolis that chosen for this study is doing maceration using organic diluents ethanol 70 mg/ml. maceration aim itself to give some time for propolis and diluents to have an interaction so that the diluents can dilute the compound inside. According to Hasan et al.\(^2\)\(^0\), using ethanol 70 mg/ml better that ethanol absolute (95mg/ml) because it can dilute more active material such as flavonoid more.

Gould\(^2\)\(^1\) said that some factors that affect the antibacterial potency of some material are concentration,
amount, and type of bacteria that will test. Related to factor type of bacteria that will be tested, MRSA VRSA is positive gram group. Propolis has some lower activity towards negative gram bacteria than a positive one.

This thing could be possible because the cell wall structure negative gram bacteria relatively complex consist of three-layer that is the outer layer is a polysaccharide, in the middle that is lipoprotein, and the inner layer is peptidoglycan so that antimicrobial compound will be hard to enter the cell and find the target. Other study shows propolis activity lower towards negative gram bacteria, was done by Agustina12 what the best concentration of propolis extract from Malang to inhibit the negative gram bacteria growth (Pseudomonas aeruginosa) is 700 mg/ml while towards positive gram bacteria (Staphylococcus epidermidis) is 600 mg/ml.

The study result of Novilla et al.22 Apis melifera propolis extract can inhibit MRSA growth in vitro. The resistivity that form is 2 mm in a concentration of 2 µg. The study from Nori E.B23 also shows that the ethanol extraction from propolis sensitive in 2 µg. Research results, inhibition zone of olive oil extracts of propolis on Staphylococcus aureus was higher (22.4 mm) than Ethanolic extracts and Water Extracts24.

This research resulted in greater inhibition zone on the material honey bee Trigona spp. Research AL-Waili, N. et al., 2012 showed that the extract of propolis and honey bees have synergy in inhibiting the growth of Staphylococcus aureus25.

**CONCLUSION**

The inhibition Trigona spp honey bee in a concentration 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml towards MRSA averagely (mm) 0; 11,2; 19,4; 21,6; 25,2; VRSA 1,6; 14; 20,2; 24; 26,6. Inhibition propolis extract Trigona spp bee in concentration 200 mg/ml, 400 mg/ml, 600 mg/ml, 800 mg/ml and 1000 mg/ml towards MRSA averagely (mm) 8,4; 10,2; 13,2; 15,2; 17,8 VRSA 10,8; 12,2; 13,4; 15,4; 16,4

Minimum concentration that will form the biggest inhibition of MRSA and VRSA towards propolis extract and Trigona spp honey bee is 1000 mg/ml.

**Gratitude**

This research received funding from research training of health personnel in 2015, thus conveyed appreciation for Politeknik Kesehatan Kemenkes Banjarmasin institution and stakeholders.

**Ethical Clearance:** Taken From Health Research Ethics Committee Politeknik Kesehatan Banjarmasin

**Conflict of Interest:** Nil

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10. Trubus. Propolis dari Lebah Tanpa Sengat Cara


Barriers Faced by School Community in the Prevention of Smoking Initiation among Early Adolescents

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¹School of Nursing, Brawijaya University/Student of Doctoral Program in Nursing, Faculty of Nursing, University of Indonesia, ²Faculty of Nursing, ³Faculty of Medicine, University of Indonesia, Indonesia

ABSTRACT

Introduction: Smoking is commonly acquired during adolescence. Most of adult smokers start smoking at a young age. Therefore, it is important to have a smoking prevention program. Objective: The purpose of this study is to explore the barriers experienced by a school community in preventing smoking initiation among early adolescents. Method: The research employed descriptive phenomenology design with 25 people as the research participants consisting of nurses, junior high school students and teachers. Result: The participants have made an effort to overcome smoking behavior, which consists of three themes such as preparation, implementation, and evaluation of barriers. Conclusion: The barriers of the smoking prevention program in the adolescence stage, including the preparation, implementation, and evaluation, are very complex. Therefore, it requires a strong commitment from teachers, students, and parents. It is necessary to provide school nurse, interactive promotion of smoke-free lifestyle, and intensive monitoring and evaluation of the smoke-free program at schools.

Keywords: smoking prevention, health promoting school, community health, adolescents, phenomenology

INTRODUCTION

Some research revealed that smoking is a learned behavior during adolescence.¹ Teenagers who are increasingly addicted to nicotine will find it hard to quit smoking.² The low social support from family has been identified as the most influential factor in the smoking initiation among them.³ A comprehensive approach is important in the implementation of the smoking control program to address the systemic, psychosocial, and environmental factors influencing the smoking initiation.²

Nigeria has made efforts to reduce the high prevalence of adolescent smokers in the community such as enforcing the regulation which bans cigarette sales for children and adolescents as well as establishing a health education.³ On the other hand, research in New Zealand indicated that there are barriers in the efforts to stop the smoking behavior among youth and adults such as the tendency of not using prevention tools, the strong relationship between smoking cigarettes and drinking alcohol, and the social benefits among teenagers.⁴ In Indonesia, the program of smoking prevention and control has been developed. It is known as the smoke-free community. This community is intended to reduce the number of smokers which increases every year. However, the implementation is still not optimal. Therefore, the barriers to the implementation need to be examined. The purpose of this study is to explore the barriers experienced by the community in preventing the smoking initiation of early adolescents.

METHOD

Employing descriptive phenomenology design, the research was conducted within the period of October 2016 to October 2017 (1 year) by the nurse team of community specialists.

The participants in this study were selected by using snowballing technique. The inclusion criteria of the
participants are teachers and nurses who act as managers of the smoke-free program at school. The researchers built trust by conducting 4 to 6 meetings. The researchers visited the school to interview the participants. Prior to data collection, the researchers explained the research objectives, benefits, and procedures to the participant. Further, the participants were asked to sign a consent form. The data were collected using through in-depth interviews. Semi-structured questions were used in the interviews. The duration of each interview ranged from 30 to 60 minutes, and there was no repetition of interviews.

The interviews were recorded by using an MP3 recorder and the results were compiled into an MP3 file. The voice data from the interviews were then transcribed using Microsoft Word. The interview transcripts were then confirmed by the participants to ensure the originality and reliability. All participants agreed with the content of the interview transcripts. Then, the transcripts were analyzed using data triangulation techniques to identify key keywords, sub-themes, and major research themes. Data saturation was obtained after the number of participants reached 25 people, consisting of nurses, junior high school students and teachers.

RESULTS

The barriers that emerge when the participants reduce smoking behaviour among adolescents can be classified into three categories: preparation, implementation, and evaluation barriers.

Preparation barriers

The preparation barriers reflect the constraints in fulfilling the prerequisites to carry out the efforts of controlling the smoking behavior of adolescents. These barriers are the difficulties of collecting basic data. The participants admitted that they did not know how to collect the data from teenage smokers at school.

“The difficulty lies in identifying the number of students who smoke” (Nurse_3).

The second barrier is the problem of human resources. They said that there is a lack of nurses available and the health volunteers are often changed.

“Not enough nurses available” (Nurse_2).

“It is a problem that the health volunteers are often changed” (Teacher_4).

The third problem in this preparation barrier is the priority of task completion. The nurses stated that the assignment was more dominant on the curative effort. Health promotion is not a priority and there is no smoke-free program.

“There has been no promotive implementation, only the curative one” (Nurse_1).

“There is no smoke-free program specifically in the Health Promoting School” (Teacher_2).

Implementation barriers

The barriers to the implementation experienced by participants are changes in the schedule of activities and the unsustainable of teachers in charge of Health Promoting School. The first obstacle is the changes in the schedule of activities, commonly related to the learning implementation and sudden schedule changes. This can hamper the implementation of the program. Identifying specific schedules for the implementation of Health Promoting school activities in junior high schools is difficult due to the establishment of the full-day school program.

“It is hard to find much spare time in a full day school” (Student_4).

“If there is a sudden agenda in school, it becomes a bit troublesome” (Nurse_2).

It is also constrained by the ineffectiveness of the implementing staff at Health Promoting School. The changes of teachers in charge of Health Promoting School, the absence of substitute teachers, and the burden of training are some of the barriers. The changes of teachers in charge of Health Promoting School and the absence of substitute teachers were reflected by these following statements:

“The teacher in- charge was changed yesterday” (Nurse_6).

“I am so occupied because there is no substitute teacher” (Nurse_5).

The changes of teachers in charge of Health Promoting School often overburdened the nurses to train them. This is felt by the nurse participants as a setback to the starting point of Health Promoting school activities.
“The work becomes more intense because I have to teach them” (Nurse_1).

The targets of activities are also important. One of the targets that are difficult to be involved in the activities to support Health Promoting School is parents. This situation can be seen from the statement of this participant:

“It is so difficult to gather the parents” (Teacher_1).

These preparation and implementation barriers have an implication for the evaluation of Health Promoting school activities.

Evaluation barriers

These barriers are in the form of activities which are not optimal in shaping a healthy behavior. Based on one participant’s experience, forming a healthy behavior requires a continuous effort.

“Forming a behavior has to be in a continuous manner” (Teacher_7)

DISCUSSION

The effectiveness of smoking control efforts should be ensured through targeted implementation and involves an active cross-sectorial cooperation. The program from the WHO Framework Convention on Tobacco Control applies various programs to control smoking behaviour such as education, communication, training, and public awareness improvement. Education as an effort to prevent and control smoking initiation has to be well-applied starting from a young age in an educational environment or school environment either junior high or high school level.

The results of a previous study conducted in a junior high school setting indicate that school-based smoking prevention program could improve students’ knowledge of smoking and its bad effects, which also motivates them to have a better smoke-free attitude. The program is universal and aimed at all students. There are other more specific programs such as mentoring and guidance designed for children who are at a greater risk of smoking, such as children who have problems in their family or experience academic difficulties. The preparation in the program planning requires managers to obtain basic data related to the smoking behavior of students and data showing individuals who have greater risk factors as the target of smoking prevention and control program.

The statements from teacher and nurse participants at school reveal the barriers faced as managers of a smoking prevention program in collecting basic data on the prevalence or number of smokers. The results of a study conducted in Northern Africa show that more than half of the study groups kept smoking behaviour as a secret and hid the cigarettes from people in their environment. This can be a barrier to identifying the number of students who smoke.

Nurses are also constrained by the limited number of human resources that is the number of nurses at schools. The intervention for stopping smoking behavior by a nurse at a school has been proved to be feasible and effective in reducing the number and frequency of teenage smokers in school. These adolescents need accessible services to help them quit smoking. Nurses as professionals in the school environment are equipped with trainings and skills to deal with adolescents, thus having a unique approach. The number of human resources (nurses) adequately adjusted to the program objectives will facilitate the nurses in implementing the program.

Health professionals including nurses can become role models and educators in controlling smoking. Nurses are regarded as those having health knowledge and can be an example in a group. Additionally, nurses play a role as opinion builders which are required to explain the diseases or problems related to smoking, premature death, and economic burden. They also need to express their support for tobacco control efforts.

The role of nurses at schools is more active in the prevention, promotion, and supportive efforts. According to Pbert (2011), school nurses can act as counselors for smokers (students) and as educators to control smoking behavior through home visits. The participants revealed that in performing their duties, nurses tend to play the curative role. The shifting of nurses’ role from promotive efforts to curative efforts becomes one of the barriers to the implementation of smoking prevention and control. Nurses who do not understand their roles cannot prioritize the roles to be performed.

The barriers encountered by the managers of the smoke-free program at schools not only occur in the preparation but also in the implementation stage. The statements of the teachers and nurses showed that there
were barriers such as the schedule of activities that often clashed with school programs, non-continuous cooperation between teachers and nurses, as well as the difficulty in presenting the target of activities especially the parents of the students.

In general, the barrier in cigarette control program is the strong relationship between smoking, alcohol, and social benefits among adolescents in certain groups. This makes the challenge to implement the program in the community becomes harder. The school environment is inseparable from internal regulatory barriers. Some participants said that the time for implementing the program is limited due to the students’ full schedule and the implementation of full-day school program. One of the challenges to become a smoke-free school is time and commitment. Schools are expected to be able to present the smoke-free education in an easy-to-understand program or activity, despite the tight academic activities. Schools often see this as a non-priority program. So, the commitment to providing time for the implementation is low.

The school-based approach for preventing the smoking behavior of adolescents is considered as the most effective effort. Supportive and promotive actions are modeled in the relationships among students, teachers, parents, and even wider community. It is intended to build a strong support structure among teenagers. There are important factors, such as making mutual ownership, establishing good relationships with the environment, building confidence, thinking positively and developing social skills.

The role of nurses and teachers as role models is very important for students in the school environment. They are considered as individuals having knowledge and can become role models in a certain group. The difficulty to have human resources that can adapt to the curriculum of the smoke-free program and the availability of different human resources in each region are seen as constraining factors. Besides that, some schools do not understand how to gain access to the resources they need to effectively implement the smoking prevention. This has been revealed by the participants who stated that one of the barriers they face is the availability of insufficient human resources and frequent replacement of program managers.

Another important component that needs to be provided in the program is effective communication. Most non-smoking school policies lack of strength and are ineffective. The lack of knowledge, low confidence, and support among students, teachers, supporting staff, and parents will negatively affect the effectiveness of the program. The establishment of effective communication between managers can improve the effectiveness of the program implementation. An ineffective communication between managers is also revealed by participants and is seen as a barrier to the program.

The involvement of various parties, including parents in the program, is seen as an important form of program sustainability. It is known that a teenager is more likely to become a smoker if one of the parents is a smoker. Parents have an important role in shaping the decision-making patterns of their children in relation to the development of smoking behavior. It is essential to maintain the parents/guardian involvement as part of the policy in supporting the role of schools in shaping healthy behaviors by families in local communities. The lack of parental involvement in the program will contribute to the ineffectiveness of the smoke-free program. One of the participants expressed that it is difficult to maximize the parental involvement in the program implementation.

The evaluation barrier of this smoke-free program implementation was mentioned by the participants. Establishing a healthy behavior requires program sustainability. Therefore, education is an appropriate way to change individuals’ behavior. In the United States, education has been proved to change individuals’ behavior more quickly when the information about the dangerous risks of smoking is distributed. However, the focus of a smoking prevention program is not merely on the educational stage. It requires further consideration of the ongoing control program on smoking behavior. It is important to implement a sustainable program not only in terms of education, but also in relation to research and the development of policies and interventions to prevent smoking behavior among teenagers as well as to help adolescents quit smoking.

The implementation of smoking prevention and control program among adolescents is important especially in the school setting. The implementation of school policies for preventing and controlling smoking initiation is an important effort. The barriers in the effort
to achieve optimal results in controlling adolescents’ smoking behavior are quite complex including the preparation, implementation, and evaluation. Therefore, the effort requires a strong commitment from the program managers who have to support the implementation of the program in terms of human resources availability, infrastructure, and the involvement of various parties including parents.

CONCLUSION

The majority of adult smokers start smoking at an early adolescence stage. Therefore, a comprehensive approach is important for cigarette control program. The barriers to the implementation of a smoking prevention program at schools including preparation, implementation, and evaluation are very complex. The program requires a strong commitment from teachers, students, and parents. Thus, it is necessary to provide school nurse, interactive promotion media of smoke-free lifestyle, as well as intensive monitoring and evaluation in the implementation of the smoke-free school program.

Ethical Clearance: This research has obtained ethics approval from Research Ethics Committee, Nursing Faculty, University of Indonesia (Approval No.0528/UN2.F12.D/HKP.02.04/2016).

Source of Funding: We are grateful for The Ministries of Research, Technology, and Higher Education Republic of Indonesia in funding this research.

Conflict of Interest: Nil

REFERENCES

The Behaviors of Ethical Leadership of Division Head Nurses at Advanced Hospitals Under Ministry of Public Health: A Qualitative Study

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1PhD Candidate, 2Ph.D in Nursing Management program and College of Nursing, Christian University of Thailand, 3Ph.D in Nursing Management program, Christian University of Thailand

ABSTRACT

Aim: To examine the ethical leadership behaviors among division head nurses in advanced hospitals under Ministry of Public Health.

Method: A qualitative study with Delphi technique was used to collect data. The participants consisted of 12 administrators who have obtained ethical awards or published ethical research and 17 experts on the ethical issue. The data was generated from open-ended interviews and the questionnaires related to division head nurse’s ethical leadership. The content validity was 0.84. The index of item-objective congruence was 0.57 to 1.00.

Result: The behaviors of head nurses' ethical leadership included 57 items. Thirteen dimensions were established including: caring, responsibility, honesty, managing fairness, integrity, advocacy, consciousness, sacrifice, friendly interpersonal relationship, ethical communication, reinforcement, ethical decision-making, and ethical organization climate.

Conclusion: This study demonstrated behaviors related ethical leadership which will be an enable the ethical leadership training for division head nurses, and can be applied in providing guidelines to enhance the ethical leadership competencies of division head nurses.

Keywords: Ethical leadership, Leadership behavior, Leadership, Division head nurses

INTRODUCTION

Leadership is the behavior and characteristic that leaders expressed which leaders influence people by creating power, motivating compliance, and impaction the organization outcomes.1 In modern society, the important competency of leadership not only has high skills of management but also ethical leadership, which are needed to achieve the organization’s goal. Several studies claimed that the behaviors of ethical leadership were demonstration of normatively appropriate conduct through personal actions, and interpersonal relationships promotion of such conduct to followers through two-way communication, reinforcement, and decision-making to achieve the organization’s goal.2,3

The division head nurses have crucial roles in the nursing organization in terms of management and delivery the policies from the nursing department to nursing units through the nursing division. Therefore the position of division head nurses requires that individuals who hold an ethic, and being a role model.4 From a literature review during 2005-2015 revealed that the ethical leadership studies have been studies in the business and education field, such as Manyat5 found that ethical organizational culture and ethical organizational climate were factors affecting ethical leadership of school administrators. There were only few studies in the nursing field such as an ethnography meta-analysis qualitative research by

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Makaroff et al. revealed that ethical leadership in nursing was being responsive to practitioners and providing support for increasing the capacity of ethical issues in the day-to-day work. Prichayudh and Oumtanee studied the experience of Buddhist leadership in head nurses and found that the head nurses who applied the Buddhist path not only in their life but also integrated into their working life as a nursing administrator and taking care of nurses in the organization. Jantawong et al. focused on the factors of ethical decision-making behavior of head nurses; findings demonstrated that head nurses rated their decision-making behaviors at the high level, and the working environment factor significantly influenced ethical decision-making behavior of head nurses (p < .05). From the gaps of the previous studies, the aim of this study was to examine the ethical leadership behaviors among division head nurses in advanced hospitals under the Ministry of Public Health.

METHOD

A qualitative method with purposive sampling Delphi technique was used in this study. The participants of in-depth interview consisted of 12 nursing administrators who have obtained ethical awards or published ethical research; and 17 experts in ethical issue for a Delphi technique.

Research instruments: The process of research instrument development divided into three phases:

Phase 1 Developing instrument: The researcher created interview guide based on literature review and the conceptual framework of Brown et al.

Phase 2 Developing the questionnaire: The researcher developed the 59 items, five -rating scales questionnaires based on key informants. The questionnaires were approved by seven experts in the ethical field. The content validity was 0.84. The index of item-objective congruence ranged from 0.57 to 1.00.

Phase 3 Structure of the ethical leadership questionnaires: The initial contribution from the ethical experts was collected in the form of answers to questionnaires and their comments to these answers.

Data collection: The data was collected by an in-depth interview using semi-structure questionnaires from February 2017 – April 2017. The data collection was divided into three parts including; prior, during, and completion of the interview. The seven semi-structured questions of in-depth interviews as following:

1. How the division of head nurses presented the ethical leadership behaviors?
2. What are the potential ethical leadership behaviors of division head nurses?
3. What are the appropriately ethical leadership behaviors of division head nurses according to social norm?
4. How is the ethical leadership of division head nurses promotion of such conduct to followers through communication to express themselves in the way of the leader?
5. How are the division head nurses to empower subordinates?
6. How the division head nurses is making decisions about ethical practice?
7. What other expressions of ethical leadership behaviors of division head nurses are there?

Data analysis: Data analysis from the interviews was analyzed by content analysis following Strauss and Corbin and the data analysis of Delphi technique was as follows.

Step 1 Round One Delphi study. The researcher asked general questions to gain a broad understanding of the 17 experts view on ethical leadership. The 58 - questionnaires were collated and summarized the responses. Only one question was extracted because it was irrelevant content to ethical leadership behaviors.

Step 2 Round Two Delphi study. Based on the first round, there was no question was extracted that 57 - questionnaires with interquartile range (IQR) of ≤ 1.50.

Step 3 Final round Delphi study. Based on the results from the second round, the 17 experts confirmed the accuracy and relevancy of the panel of experts agreed with 57 ethical leadership questions.

Research Findings

The findings revealed that the ethical leadership behaviors in division head nurses consist of 13 dimensions with 57 items, the dimensional quotes as following:
Caring demonstrated by showing of kindness, concerning, taking care, and helping subordinate both working and personal life as quoted that “The division head nurses should have cared for subordinates by helping them to solve problems including health problems, family problems, or working problems.”

Responsibility demonstrated by having a duty to complete a task, showing responsibility to the results even if an error occurs, and putting the right man on the right job as quoted that “The division head nurses have to have a responsibility to their tasks and their subordinate’s task, not get off when the task is failed.”

Honesty demonstrated by being on time, being straightforward behaviors consistent with actions, verbalization, and thinking, and no corruption as quoted that “The division head nurses have to have honesty, including no cheating working time, working on time, no hidden agendas or corruption, concerning the organization benefit, and carrying out straightforward.”

Managing fairness demonstrated by equality, justification, and following the rules as quoted that “The division head nurses have to show neutral behavior, reasonable and equality such as assign subordinate for training, the division head nurse should consider the fairness.”

Integrity demonstrated by being a good role model, behaving ethical behaviors both in professional and personal life, and respect the other as quoted that “Ethical leaders should be a good role model and do not have personal issue that may disturb the task.”

Advocacy demonstrated by protection the others, and concerning the human right of subordinates in an appropriate way as quoted that “The division head nurses have to promote the right of a subordinate in terms of received health check-up every year, and working in the good circumstance.”

Consciousness demonstrated by showing knowledge, concentrating on the present, and being consciousness all the time as quoted that “The division head nurses have to concentrate on their jobs, focus on the present and keep concentrate whether speaking or acting.”

Sacrifice demonstrated devote to the job, and do not expect anything to return as quoted that “The division head nurses have to sacrifice to the job when the members of nursing teams were less than the number of patients and sometimes working on the weekend.”

Friendly interpersonal relationship demonstrated by making friends with subordinates as their family, having a good relationship, and caring the feeling of subordinates as quoted that “The division head nurses have to show their respect, friendly, no harm to subordinates. Moreover, ready to develop the organization with subordinates.”

Ethical communication demonstrated by giving direct communication, having reasonable, making two-way communication, having a chance for subordinates to show their opinion, and being deep listen and understand correctly as quoted that “The ethical leadership should have two-way communication by understanding clearly, speaking clearly and fact.”

Reinforcement demonstrated by building motivation, and encouraging subordinates to have a chance to enhance ethical and nursing knowledge as quoted that “The reinforcement is very crucial for subordinates in term of contributing their power.”

Ethical decision-making demonstrated by making a decision based on reasonable and being neutral, and doing based on evidence-based as quoted that “The division head nurses must have a decision making based on the studies, unbiased and fairness.”

Ethical organizational climate demonstrated by promoting the policies to support activities in the organization, meeting and sharing the ethical knowledge with all members, having happiness in the work place as quoted that “The division head nurses have to develop the ethical policies in order to promote ethics knowledge to members, concerning about justice, and doing the right thing continuing through all members.”

The Categories of Ethical Leadership Behaviors

This section demonstrated the categories of each ethical leadership behavior of division head nurses with Mean and inter-quartile range as following:

Firstly, caring was willing to help others, asking subordinates regarding problems at work and personal life, un-ignoring, and listening to subordinates (Mean=4.80, IQR = 1.00). Responsibility was showing responsibility of own works including mistakes, and assigning tasks depending on ability (Mean=4.75, IQR=0.63). Honesty was being a role model for working on time, following on a promise to subordinates, works with honesty, and
management team with transparency (Mean=4.50, IQR=0.88). Managing fairness was listening without judgment, righteousness, giving an opportunity, and considering the merit with the standard criteria (Mean=5.00, IQR=0.80). Integrity was being a good role model for works and personal life, respect individuality, and politeness (Mean=4.40, IQR=0.70). Advocacy was debating when subordinate received works that are not relate to nursing tasks, protecting subordinate when they were accuse without faults, recommendation the use of current welfare and claim advocacy for subordinates (Mean=4.00, IQR=0.75). Consciousness was thinking carefully, working with caution, focusing, controlling self-control (Mean=4.50, IQR=1.00). Sacrifice was coordinating and assisting the subordinates to perform urgent tasks in a timely manner, willing to sacrifice personal time to participate in professional activities and extraordinary activities (Mean=4.25, IQR=0.63). Interpersonal relationship was treat subordinates as a family, good relationships with subordinates, and sensitive to the expression of subordinates (Mean=4.67, IQR=1.00). Ethical communication was providing useful information, being appropriate communication, giving a chance to speak out other opinions based on reasonable ideas without argument (Mean = 4.40, IQR=0.90). Reinforcement was giving positive reinforcements, supporting subordinates to ethical advancement, being a consultant in ethical practice, coaching, promoting ethical practice and research skills (Mean=5.00, IQR=0.90). Ethical decision- making was searching information to support decision-making, clarifying decision, decisions making based on justice and evidence based (Mean=5.00, IQR=0.60). Ethical organizational climate was creating policy regarding ethical activities, setting road map concerning ethical standard of a hospital, clarifying ethical issues with subordinates, setting ethical meeting, and supporting happy workplace (Mean=4.80, IQR=1.00).

**DISCUSSION**

This qualitative research was conducted with Delphi technique to generate new insight of the ethical leadership behaviors of division head nurses. The findings revealed that the 13 behaviors of division head nurses’ ethical leadership. The number of component discovered differs from previous studies in the service, and education context abroad. Makaroff, et al9 found that two components of ethical nursing leadership must be responsive to practitioners and to the contextual system in which they and formal nurse leaders work, required receiving and providing support to increase the capacity to practice and discuss ethics in the day-to-day. Also Kar14 suggestion ethical leadership had four components including values, vision, voice, and virtue, and Manyat4 found that ethical leadership of education administration study had 10 components of honest, commitment, accountability, organizational culture, ethical organizational climate, and vision etc.

For the details of each ethical leadership behavior, **caring** behaviors were expressed by kindness, helping subordinates both in professional and personal issues were similar to the study from Brown, et al,2 and Palsam.15 **Responsibility** was to responsible for their duties consistent15 and the responsibility were expressed assign work to the right person similar to the study from Prichayudh and Oumtanee.7 **Sacrifice** was similar to Thailand Nursing and Midwifery Council16 which stated that nursing administration should have ethical behaviors which pay attention to the benefits of the organization more than his or herself. **Advocacy** referred to protection of the right of subordinates that similar to Fry and Johnston’s study.17 **Integrity** referred to being a good role model for subordinates both professional work and personal life related to Thailand Nursing and Midwifery Council16 which stated administrator should work with morality, virtue, and according to the expectations of society and professional ethics. **Honesty** was consistent with Brown, et al.2,3 and the honesty behaviors including being on time, no hidden agenda at work, and no corruption.15,18 **Managing fairness** was similar to Brown, et al.2,3 stated that the administration was managing fairness and equity.5,7,15 **Consciousness** was similar to the study of Prichayudh and Oumtanee7 referred to being conscious of self and concentration to the present. **Ethical communication** was similar to Palsarn15 that indicated two-way and open-minded communication. **Friendly interpersonal relationship** was relationship in consideration of subordinate’s mind which was similar to Palsam’s study.15 **Ethical decision making** referred to making rational decision making based on evidence and neutral, and **reinforcement** was positive reinforcement, reward, and recognition to subordinates; both categories were similar study by Brown, et al7 that consistent with Brown, et al.2 **Ethical organizational climate** was put in the Thailand Nursing and Midwifery Council policy,16 Manyat4 also conducted it as formulating policies, virtuous activities.7

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CONCLUSION AND IMPLEMENTATIONS

This research study revealed the new body of knowledge concerning the ethical leadership behaviors of division head nurses consisted of 13 dimensions and 57 items. These findings can be applied in providing guidelines to enhance the ethical leadership competencies of division head nurses. The practical implications for nursing administration is that the ethical leadership instrument can be developed based on these research findings and be used as guideline for training of nursing administrators to improve ethical leadership behaviors. The further study should be the relationship model of ethical leadership of nursing administrators and the nursing organizational performance.

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Conflicts of Interest: The authors have no conflicts of interest.

Ethical Clearance: Ethical Clearance was taken from the ethical committee of a private university in Thailand (IRB approval No 28/2560 Feb 18, 2017). We protected personal information and ethical concerns which includes informed consent and maintaining confidentiality. The participants were asked to give their permission to be part of a study. They were also assured of their right to confidentiality and anonymity.

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Quality of Medical Record Document Management System in Banjarmasin Islamic Hospital Installation in 2017

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ABSTRACT

Quality services not only in medical services, but also in the management of medical record documents (assembling, coding, indexing, filling, and retention) which are one indicator of the quality of hospital services. Based on the report in Banjarmasin Islamic Hospital, there were several problems in managing medical record documents which can be seen from the data in 2017, the incompleteness of medical records was found at 59.36%. Encoding (coding) medical record files still found 20% inaccuracy and 100% coding for medical treatment. The indexing activity is only carried out in 3 (three) indexes, storage or filling is still a 10% misfile. The purpose of this study was to find out the quality management system of medical record documents at Banjarmasin Islamic Hospital in 2017. The study used qualitative research on phenomena in the scope of research. Data collection techniques use the interview method and review documents available in the medical record unit. Primary data sources are obtained from the results of in-depth interviews and observations.

Keyword : Medical record document, Hospital management, Quality of hospital service

INTRODUCTION

The hospital is a service institution that requires good management in order to provide maximum health services. The hospital must have adequate human resources, facilities and infrastructure and be managed professionally so that the hospital can carry out its functions properly1.

Quality services not only in medical services, but also in the implementation of medical records which are one indicator of the quality of hospital services that can be known through the completeness of filling medical records. The medical record unit is responsible for managing patient data into health information in a medical record document that is useful for decision making and can be one measure of patient satisfaction in receiving services. Medical records have a very important role therefore good and correct management will facilitate administration in improving the quality of hospital services. Banjarmasin Islamic Hospital is a private hospital with type C classification and has 105 beds, with the number of visits in 2016 as many as 5039 inpatients and 4408 outpatients. The number of visits in 2017 (up to September) inpatients were 2873 people and outpatients were 2950 people.

Based on the report in Banjarmasin Islamic Hospital there were several problems in managing medical record documents can be seen from the data in 2016 found incomplete medical records by 70% and in 2017 incomplete medical records were found at 59.36%. Encoding (coding) medical record files still found 20% inaccuracy and 100% coding for medical treatment. The indexing activities are only carried out in 3 (three) indices, namely the patient’s main index card, death
index, and disease index of the 6 indices that must be made by the indexing section. Storage or Filling still occurs 10% misfile because it does not use tracer, the loan bill is a substitute for medical record documents. Depreciation/retention of medical record documents in Banjarmasin Islamic Hospital is not carried out in accordance with the retention schedule where the sorting between active Medical Record Documents into inactive Medical Record Documents is carried out every year.

The research objective is to find out the aspects of input in quality management of Medical Record Documents which include Human Resources, funds, and facilities at Banjarmasin Islamic Hospital in 2017. Knowing the aspects of the Process in managing the quality of medical record documents which includes implementation (assembling, coding, indexing, and filling), and reporting at Banjarmasin Islamic Hospital in 2017. Know environmental aspects in quality management of medical record documents covering policies at Banjarmasin Islamic Hospital in 2017.

MATERIAL AND METHOD

This research is a qualitative study of phenomena that exist in the scope of research, which aims to evaluate the management system of medical record documents. Qualitative data is supported by data retrieval data using the interview method and reviewing documents available in the medical record unit.

The research subjects consisted of 8 participants: 1 Head of Medical Record, 5 medical record staff, 1 doctor, 1 room administration

FIND AND DISCUSSION

Input Management of Medical Record Document

Human Resources

The results showed that the quantity and quality of human resources in the Medical Record Installation Banjarmasin Islamic Hospital had not met the minimum standards for the management of medical record documents because the medical record document management officers were still in the educational background of Upper High School and not 4 medical records. people and only 1 person who took part in the training had lasted a long time, 3 medical record document management officers had never attended training in the medical record field because all this time the training activities that were often held were about reporting and accreditation. This is not in accordance with the Republic of Indonesia State Apparatus and Bureaucratic Reform Regulation No. 30 of 2013 on Chapter XI concerning the formation of medical record functional functional offices which states that type C hospitals have the lowest skilled diploma III (D.III) medical records, and health information as many as 30 people and experts with the lowest degree of Bachelor (S.1) / Diploma IV (D.IV) medical records and health information as many as 6 people.

Fund

Funding for operational management activities of Medical Record Documents is accepted in the form of forms such as medical record forms, Primary Patient Index Cards, medical record covers, papers, printers available, and other facilities.

Tool

Based on the results of the observation and supported by the results of the interview, it was found that the facilities and infrastructure of work support for the management of the Medical Record Documents were available but not appropriate. This was due to the lack of space available at the hospital for medical record document management officers so that the filling room with the officers was still one, and the facilities in the filling room were not adequate.

Process of Managing Medical Record Documents

Implementation

Assembling

The results of in-depth interviews and document observation in assembling activities in the completeness of forms, document filling and timeliness of the return of medical records found that the management had not run optimally. Where according to the Participants there are many diagnoses and doctors’ signatures, especially in the medical resume section which has not been completed because the policy is in the form of Standard Operating Procedures that have not been specifically set about the implementation of assembling activities. This is consistent with the research of Fauziah (2014) which states that the impact of delays in returning Medical Record Documents causes delays in processing data for hospital reports, inpatient Medical Record Documents
not stored on document storage racks making it difficult to search documents, while for patients it affects subsequent treatment process.4

Coding

Based on the results of in-depth interviews and observation of documents about the implementation of the coding of the disease that the implementation has not run optimally. Participants stated that they did not encode medical measures so that they affected the quality of the coding results.

From the results of the coding process research based on the informant the coding officer coded according to the diagnosis established by the doctor who examined the patient, but did not do the coding of the actions taken by the doctor to the patient. Because the coding officers did not understand how to code the actions, this was also caused by the coding officers having never included coding training in accordance with the 2013 Medical Recorder Functional Position Directive. This is in line with Indawati’s (2017) study that there are no Standard Operating Procedures Code determination makes the officer feel obliged to do the coding. Usually what is missed to be coded is for outpatient disease cases.5

Indexing

Based on the results of in-depth interviews with participants in charge of medical records as well as direct search of documents in the indexing section the types of index cards made in the medical record installation of the Banjarmasin Islamic Hospital are the indices performed by officers only 3 index types, namely the Primary Patient Index Card, disease index and index Dead. The indexes that are made will be submitted to the reporting section that will later be used to make hospital reports. Index card recording is still done manually on the available forms. This is due to the absence of computer facilities. According to the Directorate General of Medical Services Development (2006) suggested that the data tabulation process carried out computerized was easier and faster and more effective and efficient. This is supported by several informants in the medical record unit that the use of electronic medical records coding section is very helpful in finding work.6

Filling

The filling process is decentralized which is separated between storage of outpatient medical record documents and inpatient medical record documents. The alignment system applies a Digit Filling Terminal system which is a storage system that aligns Medical Record Documents based on the sequence of medical record numbers at the last 2 digits or group digits. The form of medical record document storage is still manual, which still uses wooden shelves that cannot be moved. The process of taking the patient’s medical record document is done by looking at the medical record number of the last month of visit, by not using tracer as a marker of the patient’s medical record document coming out of the storage rack and when taking it if it does not mention the patient’s last month of visit, it will be difficult for the officers to search, besides also if during storage does not match the last month visit this results in misfile of Medical Record Documents.

Based on operational standards, the procedure for borrowing medical records in Banjarmasin Islamic Hospital does not use tracer in carrying out the process of borrowing medical record files so that they are not in accordance with what was stated by the Ministry of Health 2006. in a storage rack by aligning medical record documents based on the sequence of medical record numbers on the 2 end group numbers. This study is consistent with Anggara’s (2015) study which states that the implementation of medical record document alignment at Ken Saras Ungaran Hospital, juxtaposition of medical record documents is aligned based on the sequence of medical record numbers in the final 1 digit number.7

Reporting

Based on the results of in-depth interviews with reporting officers and review documents about the reporting process that officers must report internally to the Director of Banjarmasin Islamic Hospital in the form of hospital indicators and external reports to the City Health Office and Provincial Health Office in the form of Hospital Based Disease Surveillance reporting and reporting of Integrated Surveillance of Diseases that can be prevented by Hospital-Based Inpatient Immunization. Reporting Drug and Food Inspection Center in the form of poisoned patient case data in accordance with the existing reporting format.

In sending the report is still done manually, not using an online system because online data transmission not only collects data from the medical record installation
but also from every installation in the hospital so that the
delivery of the report is constrained because the data is
not all collected. According to the Law of the Republic
of Indonesia Number 44 of 2009 Chapter XI concerning
recording and reporting that every hospital is obliged to
record and report on all hospital organizing activities
in the form of Hospital Management Information
Systems\(^8\). Implementation Guidelines and Procedures
for Hospital Medical Records published by the Ministry
of Health in 2006 stated that external hospital reports
made in accordance with the needs of the Indonesian
Ministry of Health which includes RL 1 containing basic
hospital data, RL 2 contains data on patient morbidity/
mortality, RL 3 contains data hospital service activities,
RL 4 contains workforce data, RL 5 contains medical
equipment data and hospital performance and RL 6
contains data on hospital nosocomial infections\(^8\).

Environmental Management Medical Record
Documents

Based on the document search on the standard
section of the medical record installation service at
Banjarmasin Islamic Hospital, the service policy for
managing Medical Record Documents includes: Medical
data processing, Medical Record Storage, provisions for
filling medical record files.

In the policy issued by the director of the Banjarmasin
Islamic Hospital where it has included human resource
policies and service policies in the form of managing
Medical Record Documents that should be carried out
by medical record installations and medical record
document management officers, there are still those that
do not comply with the policy standards. issued by the
director of Banjarmasin Islamic Hospital. So that the
quality control of the hospital has not been optimally
implemented. This is also in line with the Hospital
Implementation Manual in 2008 where medical record
services are part of the hospital quality control program,
therefore there must be a standard procedure to assess
the quality of services and overcome problems that arise.

CONCLUSION

Input

The level of education of the management officers
of the average Medical Record Document is still not
appropriate and the medical record training has not been
comprehensive in the new or old officers. Funding for
management activities of Medical Record Documents
sourced from Banjarmasin Islamic Hospital will be
provided when submitting a review of funds and has
been approved by the director. Supporting facilities and
infrastructure have not been fulfilled properly in parts of
filling units such as storage and security facilities.

Processs

The process of implementing quality management
of Medical Record Documents is still found in Medical
Record Documents whose returns are more than 2x24
hours, incomplete filling, coding of actions not performed
by officers, only 3 types of indexes are still found misfile
in storing Medical Record Documents. Internal and
external reporting systems are still carried out manually
where internal reports are carried out by inputting
data on Ms.Excel’s computerized so that it has not run
optimally and for external reports directly inputting the
forms already available from the Provincial/City Health
Office, and forms from the Supervisory Board Medicine
and Food.

Environmental

Environmental implementation has not been
optimally implemented in any medical record document
management activities and there are still some that have
not been fulfilled.

Ethical Clearance: this study approved and
received ethical clearance from the Committee of Public
Health Research Ethics of Medical Faculty, Lambung
Mangkurat University, Indonesia. In this study we
followed the guidelines from the Committee of Public
Health Committee of Public Health Research Ethics
of Medical Faculty, Lambung Mangkurat University,
Indonesia for ethical clearance and informed consent.
The informed consent included the research title,
purpose, participants’s right, confidentiality and
signature.

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Conflict of Interest: The authors declare that they
have no conflict interest.

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The Prevalence of Blood Borne Diseases in the Community
(A Cross Sectional Study in the District of Semarang)

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ABSTRACT

Blood borne disease is a disease that spreads through blood contamination. Pathogenic blood-borne pathogens are pathogenic microorganisms found in human blood (such as viruses, bacteria or parasites) and are capable of causing disease in humans. Blood-borne pathogens in general are hepatitis B virus, hepatitis C virus and Human Immunodeficiency Virus (HIV). However, it is rarely known data about them in community. This study aims to determine the prevalence of some diseases that are transmitted through the blood in the community that lived at the district of Semarang. This research was descriptive observational using a cross sectional approach. HIV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where HIV with anti HIV, HCV and HBV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where Hepatitis B with antigen (HBsAg) and Hepatitis C with anti HCV. The research subject is the population who live in the district of Semarang for at least one year. Samples were taken by using simple random sampling method. The number of blood samples obtained from 1421 people who have filled informed consent and stated willing to be the subject of research. The results showed that the prevalence of HIV was 0.9 per 100 population, prevalence of hepatitis B was 1.9 per 100 population, and prevalence of Hepatitis C 0.6 per 100 population. There was moderate prevalence of blood borne diseases in community. There are some factors related to the transmission of blood borne diseases in the community that need to determine further.

Keywords: HIV, HCV, HBV, Blood borne, Prevalence

INTRODUCTION

Blood-borne are transmitted by direct blood contact from injured skin or a mucous membrane [1]. The blood-borne pathogen is generally hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) [2–9]. Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) still cause high burdens of disease in developing countries. For example, 184 million and 248 million individuals worldwide are chronically infected with HBV and HCV, respectively [10–12].

Around 37 million individuals are living with HIV/acquired immunodeficiency syndrome (AIDS) globally [13–14].

HIV is a major public health problem of the global community. According to WHO, people living with HIV are in low and middle income countries [15]. More than 240 million people worldwide are chronically infected with HBV and more than 350,000 people die each year due to HCV [16]. The prevalence of hepatitis in Indonesia infected with hepatitis virus was 1.2%[10]. The prevalence of liver cirrhosis was 0.6%, and HBV was 21.8% [16].

Blood-borne diseases can spread through organ transplants, sharing needles with others in activities such as tattoos and body piercings, blood or blood products donated as in blood transfusion activities [17–21]. Based on research conducted in eastern India, there are 44,173
blood sample was collected, and tested HIV I and II, hepatitis B, and hepatitis C. From the test results found that 283 tested positive for HIV (0.64%), 1001 HbsAg-positive (2.27%), And 717 positive for HCV (1.62%) [22]. While research conducted by Baha W et al. on volunteers and the community in Morocco, found seropositive HCV and HBV from 41,269 volunteers and 23,578 community [23]. In this study, found that the prevalence of anti-HCV increases and the various risk factors identified such as age, dental care, needle syringe and history of jaundice. In addition, male sex was associated with HBV infection and a history of risky sexual behavior were found to be associated with higher prevalence of hepatitis B [23].

According to Central Java Provincial Health Profile, in 2012 it was found out from 432,341 people who performed blood sampling as much as 432,148 (99.96%), 580 samples (0.13%) positive HIV [15]. Health profile data of Central Java 2012 showed the number of new cases of HIV / AIDS was 81/110 cases and hepatitis B disease in Central Java there are 98 cases [15].

Until 2013 the prevalence rates for hepatitis B, hepatitis C and HIV continue to be found, respectively 0.012%, 0.003% and 0.002%. The purpose of this study was to estimate the prevalence of blood-borne diseases (hepatitis B, hepatitis C and HIV) in the district of Semarang.

**METHODS**

**Study Design and Sampling Procedure**

This research was descriptive observational using cross sectional approach conducted between January-July 2017. Population of this study were someone who live in the district of Semarang at least one year. Sample was selected by using simple random sampling.

Sample calculated by the formula of minimum sample size for cross-sectional study as follow:

\[
n = \left( \frac{z_{1-\alpha/2} \sqrt{2P(1-P)} + z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)}}{P_1 - P_2} \right)^2
\]

With level of significance 95%, power of study 80%, obtained minimum sample size 500 respondents.

Samples were taken by using simple random sampling method using sampling framework of house hold residence of District of Semarang. The number of blood samples obtained from 1421 people who have filled informed consent and stated willing to be the subject of research.

**Instrument Development and Data Collection Procedure**

Data collection was carried out in January-July 2017. In the process of collecting research data assisted by officers from the Indonesian Red Cross area of Ungaran for blood collection. Primary data obtained from interviews with respondents, helped by research assistance.

HIV are tested by using the CLIA (Chemilumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where HIV with anti HIV. HCV and HBV are tested by using the CLIA (Chemilumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where Hepatitis B with antigen (HBsAg) and Hepatitis C with anti HCV.

**Data Processing and Analysis**

Data is presented as a percentage for categorical data and mean ± standard deviation for continuous data.

**RESULTS AND DISCUSSIONS**

**Socio-demographic characteristics**

Most of respondents who participated in this study were male (56.2%) with age <35 years (65.2%) with education level is graduated from high school (45.3%) and 53.5% were married. Most respondents work as non-government employees (53.2%). The hypertension status of the respondent mostly are pre-hypertension (59.0%). All as seen in Table 1.

**Table 1. Socio Demographic Characteristic of Subject (n=1421)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>799</td>
<td>56.2</td>
</tr>
<tr>
<td>Female</td>
<td>622</td>
<td>43.8</td>
</tr>
<tr>
<td>Marriage status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>760</td>
<td>53.5</td>
</tr>
<tr>
<td>Single</td>
<td>638</td>
<td>44.9</td>
</tr>
<tr>
<td>Widowed</td>
<td>23</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Result of our study showed that the respondents who donated blood is 67.9%, who had drugs abuse 0.5%, who had history of sexual intercourse with multiple partners is 54.5%, and 0.7% was male who have sex with male. While respondents who have sex with drug users is 0.4%. There are 1.6% respondents that use permanent tattoo, and 6.1% use piercing. In addition, respondents also performed dental treatment, it is 16.1%. Respondents who had a history of surgery is 7.4%, and who get organ transplants is 0.5%. While respondents who received blood donor is 1.3%. (Table 2)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government employee</td>
<td>90</td>
<td>6.3</td>
</tr>
<tr>
<td>Non-government employee</td>
<td>756</td>
<td>53.2</td>
</tr>
<tr>
<td>Student</td>
<td>377</td>
<td>26.5</td>
</tr>
<tr>
<td>Soldier/police</td>
<td>37</td>
<td>2.6</td>
</tr>
<tr>
<td>Farmer</td>
<td>6</td>
<td>0.4</td>
</tr>
<tr>
<td>Fisherman</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>Merchant</td>
<td>26</td>
<td>1.8</td>
</tr>
<tr>
<td>Self employed</td>
<td>9</td>
<td>0.6</td>
</tr>
<tr>
<td>Others</td>
<td>118</td>
<td>8.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hypertension status</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No hypertension</td>
<td>395</td>
<td>27.8</td>
</tr>
<tr>
<td>Pre-hypertension</td>
<td>839</td>
<td>59.0</td>
</tr>
<tr>
<td>Hypertension grade 1</td>
<td>166</td>
<td>11.7</td>
</tr>
<tr>
<td>Hypertension grade 2</td>
<td>21</td>
<td>1.5</td>
</tr>
</tbody>
</table>

This study revealed that mostly respondents were male with age no more than 35, completed high school and married. They work as non-government employees with status of hypertension are pre-hypertension. If compare with the research conducted in Ghana to the blood volunteers, the results stated that most of the respondents were male 762 (94.3%) [24]. This is also in line with research from Janahi EM conducted in Bahrain.
in 2000-2010 about the prevalence and risk factors of hepatitis B stated that several sociodemographic variables were significantly associated with the prevalence of hepatitis B virus infection [25]. Age was one of sociodemographic factor that related to the prevalence of hepatitis B infection. It significantly increased among the age groups 25–34 and 35–44 (p<0.0001) [25]. While research conducted by ministry of justice and human rights stated that 52% was graduated from senior high school and married [26]. While study conducted by Apidechkul et al in Northern Thailand reported that respondents mostly males (15.0%), nearly half (40.3%) were 30-39 years old and nearly three quarters (62.9%) were married, and most of them were employed (89.5%) [27]. Another research conducted by Peck et al reported that among HIV infected patients there are 49.0% who had prehypertension status [28]. According to Arboli et al the hypertension status among hiv infected patients related to age (adjusted hazard ratio [aHR] per 10 years: 1.34, 95% CI 1.07–1.68, p = 0.010), BMI (aHR per 5 kg/m²: 1.45, 95% CI 1.07–1.99, p = 0.018 [29]. From our study we know that respondents mostly have history of blood donors (67.9%), but most of them never receive blood transfusion (98.8%). Just a few of them had history of drug abuse (0.5%), had history transplantation (0.5%), and had history of surgery (7.5%). We found that 16.1% had history of dental treatment, 1.6% of them had permanent tattoo, and nearly 61% had ear/nose/body piercing. And we also found that nearly half of them (54.5%) had multiple sex partner, 0.7% had homosexual partners. Beside that they also had sexual intercourse with drug users but just a few (0.4%). If compare to research conducted by Awadalla et al in Egypt reported that respondent who had surgical treatment was 22.5%, who received blood transfusion was 7.5%, while who performed dental treatment was 74.6% [30,31]. This research also reported that respondent who have sexual relations was 8.5%, while who use tattoo was 31.3%, and who had drug abuse was 5.9%[31]. While study conducted by Apidechkul in Northern Thailand reported that 23.5% respondents had history of a blood transfusion, 0.8% were intravenous drug user, 29.8% tattooed, 64.5% had body piercing, and 6.5% were homosexual [27]. If compare to research conducted by Sriragayani et al among hiv and hepatitis c co-infection reported that respondents who had blood transfusion was 20.6%, who had history of dialysis was 2.7%, who had tattoo 52.9%. The study also reported about the sexual risk factors [32]. The result showed that respondents mostly (68.5%) was homosexual and 71.6% having sex with unprotected anal intercourse. While more than half of them (64.2%) having sex with intravenous drug user[32].

CONCLUSIONS

There was moderate prevalence of blood borne diseases in community. There are some factors related to the transmission of blood borne diseases in the community that need to determine further.

Conflict of Interest: The author reports no conflicts of interest in this work.

Acknowledgement: The authors thank to Faculty of Public Health Diponegoro University for funding this study (number: SP DIPA 22/UN7.5.1/PG/2017). The authors also thank the study participants, District Health Office of Semarang with all their Primary Health Centre for their cooperation in facilitating the study.

Ethical Clearance: Ethical clearance was obtained from Ethic Commission of Health Research, Faculty of Public Health UNDIP (112/EC/FKM/2017). All subjects signed informed consent to join the study.

REFERENCES


Knowledge, Attitude, and Behavior of Farmers in the Use of Pesticides with Health Complaints in Cikandang Village, Cikajang Sub-District, Garut Regency 2017

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ABSTRACT

The use of pesticides in addition to provide benefits to control pests can also have the impacts both on humans and the environment. Therefore, pesticides should be used simultaneously according to the type, dose, target, manner, and time of application. Incorrect use of pesticides can lead to various health effects, both acute and chronic. This study was aimed to determine relationships between knowledge, attitude, and actions of farmers in the use of pesticides with a health complaint of farmers in the Cikandang Village, Cikajang District, Garut Regency. The study used cross sectional design. The samples involved in this research were 100 people who were pesticide sprayers in Cikandang Village, using accidental sampling method. Based on univariate results, 57% farmers had poor knowledge, 82% farmers had good attitude, and 79% farmers had bad behavior. According to bivariate analysis, it was found that behavior (OR = 4.24) had significant relationship with health complaint. These results indicated that counseling on pesticides and personal protective equipment for pesticide sprayers (PPE) was needed to avoid health complaint.

Keywords: Knowledge, Attitude, Behavior, Pesticide, Health complaint

INTRODUCTION

Agricultural sector is one of the main source of Indonesian economy considering that Indonesia is an agrarian country. Based on the number of manpower according to the main employment, it can be seen that most laborers are still in agricultural sector which is 37,770,165 until August 2016. To deal with the plant-disturbing organisms, the government implements several agricultural intensification policies, one of which is the use of pesticides in the eradication of pests and plant diseases. Pesticides are chemical substances used to control various pests. Based on the Agricultural Census of 2013, the percentage of horticultural farm households using more chemicals is approximately 39.6% compared to other pest control methods. Excessive use of pesticides in agriculture will make production decline. In addition, the environment certainly becomes polluted and harmful to health.

Inappropriate use of pesticides can lead to various health effects, both acute and chronic. In general, the acute effect may irritate the skin or eyes, nausea, and dizziness while the chronic effects of pesticides can affect the nervous system even death.

West Java Province has 27 districts/cities, one of them is Garut regency. When viewed the population, many residents in Garut working in the agricultural sector and reached 39.23% in 2014. Based on the temporary figures of the complete enumeration of Agricultural Census 2013, the number of agricultural enterprises in Garut regency, as many as 269 thousand, was managed by households, as many as 30 was managed
by agricultural enterprises incorporated by law and as many as 27 was managed by other than households and enterprises incorporated by law[7].

Cikandang village is one of the villages located in Garut Regency with a land area of 1,622,488 Ha. In Cikandang Village, there is Agricultural Technology Park (TTP). TTP is a pilot area of government as well as a provider of agricultural technology[8]. Most of the people in Cikandang Village choose agriculture as a livelihood[7].

Therefore, researchers would like to see how the knowledge, attitude, and behavior of farmers in the area around TTP in the use of pesticides with health complaints to farmers so that the research was necessary to be done in the Village Cikandang, District Cikajang, Garut regency in 2017.

**METHOD**

In this research, quantitative and descriptive analytic method was applied with cross sectional design. The research was conducted in Cikandang Village, Cikajang Sub-district, Garut Regency in May 2017. The population in this study was all farmers in Cikandang Village, with samples were 100 respondents. Instrument of this research was questionnaire with a list of questions related to research variables, namely demographic characteristics (age, sex, and education level), farmer knowledge about pesticide, farmer attitude in using pesticide, farmer behavior at using pesticides, and health complaint experienced after using pesticides.

Data analysis used in this research were univariate and bivariate analysis. Univariate analysis result presented on tables of frequency distribution and percentages, while bivariate analysis result presented in 2x2 table to see whether there is a correlation between two variables[9].

**RESULTS**

**Health Complaints**

Based on the table of illness complaints on farmers (table 1), it is known that farmers who experienced and did not experienced pain complaints had similar amount of pain complaints namely 50 respondents (50.0%).

Based on the table of health complaints experienced by farmers (table 2), it is known that the dominant health complaints experienced by respondents were dizziness (82%), difficulty breathing (44%), eye and skin irritation (18%), weak and tired (16%), headache (10%), And vomiting (2%).

### Table 1. Picture of Farmer Health Complaint

<table>
<thead>
<tr>
<th>Pain complaints</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Yes</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Table 2. Distribution overview of Health Complaints of Respondents In Cikandang Village, Cikajang District, Garut Regency, 2017

<table>
<thead>
<tr>
<th>Pain complaints</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weakness and fatigue</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Headache</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Excessive sweating</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Difficulty breathing</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Excessive saliva</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Blurry vision</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eye and skin irritation</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Vomiting</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Headache dizzy</td>
<td>41</td>
<td>82</td>
</tr>
<tr>
<td>Stomach upset / diarrhea</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fainting</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Relationships between Farmer Knowledge with Health Complaints**

Table 3 shows the analysis results of pain complaints were based on farmers’ knowledge. There were 50 (50.0%) farmers experiencing pain complaints and as many as 50 (50.0%) farmers did not experience pain complaints. Of the 50 who experienced pain complaints, 21 farmers (48.8%) had good knowledge and as many as 29 farmers (50.9%) had poor knowledge. The statistical test result was obtained p value = 1,000 which means that there was no significant difference in the proportion of farmers who have pain complaints based on their knowledge.
of pain complaints based on knowledge.

**Table 3. Relationships between Farmer Knowledge with Health Complaints**

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Pain Complaints</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Yes</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>22 51,2</td>
<td>21 48,8</td>
<td>43 100</td>
<td></td>
</tr>
<tr>
<td>Not good</td>
<td>28 49,1</td>
<td>29 50,9</td>
<td>57 100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 50,0</td>
<td>50 50,0</td>
<td>100 100</td>
<td></td>
</tr>
</tbody>
</table>

**Relationship between Farmers’ Attitudes with Health Complaints**

Based on the table 4, results of pain complaints analysis were based on farmer attitude. There were 50 farmers (50.0%) that experienced pain complaints and as many as 50 farmers (50.0%) did not experience pain complaints. Of the 50 farmers who experienced illness, 46 farmers (56.1%) had a good attitude and as many as 4 farmers (22.2%) had not a good attitude. Statistical test results were obtained p value = 0.019 which means that there were significant differences in the proportion of pain complaints based on attitude. Based statistical test results, it was obtained OR value of 0.22 which means that farmers who had less good attitude had 0.22 times chances to have pain complaints compared with farmers who had a good attitude.

**Table 4. Relationship between Farmers’ Attitudes with Health Complaints**

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Pain complaints</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Yes</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>36 43,9</td>
<td>46 56,1</td>
<td>82 100</td>
<td></td>
</tr>
<tr>
<td>Not good</td>
<td>14 77,8</td>
<td>4 22,2</td>
<td>18 100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 50,0</td>
<td>50 50,0</td>
<td>100 100</td>
<td></td>
</tr>
</tbody>
</table>

**Relationship between Farmer Behavior with Health Complaints**

Table 5 shows the results of pain complaint analysis was based on farmer behavior. There were 50 farmers (50.0%) experiencing pain complaints and as many as 50 (50.0%) farmers did not experience pain complaints. Of the 50 who experienced pain complaints, 5 farmers (23.8%) had good behavior and as many as 45 farmers (57.0%) had not good behavior. Statistical test results were obtained p value = 0.014 which means there were significant differences in the proportion of pain complaints based on behavior. Based on statistical test results, it was obtained OR value of 4.24, which means that farmers who had not good behavior had 4.24 times chances to have pain complaints than farmers who had good behavior.
Table 5: Relationship between Farmers Behavior with Health Complaints

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Pain complaints</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>N%</td>
<td>N%</td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>5</td>
<td>76,2</td>
<td>23,8</td>
</tr>
<tr>
<td>Not good</td>
<td>34</td>
<td>45</td>
<td>43,0</td>
<td>57,0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>50,0</td>
<td>50,0</td>
</tr>
</tbody>
</table>

DISCUSSION

Farmer Health Complaint

Based on the table of health complaints experienced by farmers, it is known that most dominant health complaint experienced by farmers was a headache as many as 41 respondents (82%), and as many as 22 respondents (44%) had difficulty breathing, and no respondents experienced excessive saliva complaints, blurred vision, Stomach/diarrhea, and fainting. Of the 41 of respondents (82%) who were poisoned included in mild toxicity symptoms while the remaining 22 (44%) were included in severe poisoning symptoms.

Health complaints are a common health symptom experienced by respondents after using pesticides. Health complaints occur after using pesticides can also be caused by poor usage of pesticides. Common symptoms include weakness and fatigue, headache, excessive sweating, difficulty breathing, excessive saliva, blurred vision, eye and skin irritation, diminished pupils, vomiting, dizziness, stomach/diarrhea, and fainting. Most respondents acknowledge headaches and difficulty breathing. This may be caused by a lack of awareness of farmers in using Personal Protective Equipment like mask, so that pesticide particles can enter through the respiratory path. Three percent of the farmers also mentioned burning sensation, catarrh, stomach pain, unconsciousness, itching of eyes and body pains as side effects from pesticides application. Based on this research, most of the respondent have bad knowledge. Of the 50 who experienced the pain complaints as many as 21 of respondents (48.8%) had good knowledge and as many as 29 (50.9%) of respondents had a poor knowledge. Based on statistical test results, it was obtained an OR value of 1.09 which means that respondents who have less good knowledge had more 1.09 times chances to have pain complaints compared with respondents who have good knowledge.

This result is in accordance with research conducted by Sankoh et al. (2016). Most farmers have less knowledge about safe handling of pesticides or as much as 71% because they have never received any training related to the use of pesticides. Respondents considered that by using pesticides the results will be quickly visible. With the expected quick results, the respondents will think that they will achieve big profits. The lack of knowledge of the respondents about pesticides can certainly be bad for health. It is important to provide information to farmers who mostly have a low level of education in order not to experience poisoning or polluting the environment.

Relationship between Farmers’ Attitudes in the Use of Pesticides with Health Complaints

Of the 50 farmers who experienced pain complaint, as many as 46 respondents (56.1%) had a good attitude and as many as 4 (22.2%) respondents had a bad attitude. Statistical test results were obtained p value = 0.019 which means there were significant differences in the proportion of pain complaints based on attitude. A good attitude in the use of pesticides itself means that respondents a tendency to use pesticides in accordance
with the correct guidelines.

This research is also in line with research conducted by Jin, Wang, He, and Gong (2016). It was stated that nearly all farmers interviewed (98%) believed that it is important to use or apply pesticides in a correct and scientific way [14].

After conducting interviews with the respondents, there found some respondents who use pesticides from mixing pesticides to dispose of pesticides in accordance with his personal experience and not in accordance with the correct instructions about the use of pesticides. Poor respondents’ attitudes can cause health problems such as poisoning, on the contrary, a good attitude in the use of pesticides can reduce the entry of pesticides into the body so as not to have health complaints.

**Relationship between Farmer Behavior in the Use of Pesticides with Health Complaints**

Of the 50 farmers who experienced pain complaint, as many as 5 respondents (23.8%) had good behavior and as many as 45 farmers (57.0%) had bad behavior. Based on the results of statistical tests, it was obtained an OR value of 4.24, which means that farmers who have bad behavior had 4.24 times chances to have pain complaints than farmers who have good behavior. Other research done in Indonesia by Minaka, Sawitri, and Wirawan (2016) also found that 54.1% of the farmers had bad behavior albeit having good knowledge [13].

Of the 100 respondents, only 1 of them were buying pesticides in the stall. The brands of pesticides used by farmers in Cikandang Village are Dhitan, Bioxan, Daconil, Demolish, Stharmex. In addition, 41 (41%) of respondents still keep pesticides in the house.

Based on the results of observations and interviews found that the attitude of respondents who have been good in the use of pesticides was not in line with the behavior, such as the use of Personal Protective Equipment (PPE). After observation, respondents only wear long sleeves, trousers, boots, hats, and only a few respondents use masks. The lack of PPE that is owned and used can affect one’s health.

In addition, the behavior of respondents in obtaining information about how to mix pesticides comes from many colleagues and their own experience, not from labels and field extension. Of the 100 respondents, 51 (51%) of the respondents mixed pesticides by not reading the labels and those reading the labels were only 49 (49%) respondents. This indicates that farmers have not been informed about the use of pesticides. Respondents assumed that with the length of work as spray farmers they were already familiar with the pesticide dosage so they did not need to read the label on the packaging.

Respondents used to mix 3-4 types of pesticides in one spray with as many as 93 (93%) respondents mixing pesticides. The reason for mixing pesticides is to increase the power to control pests. They did not read packaging labels and are more confident with personal experience during work as a sprayer. In addition, there are still many farmers who estimate the dosage and inquire with the working friend as many as 53 (53%) of respondents and who follow the instructions label or local officials only 47 (47%) respondents.

Respondents who sprayed pesticides by moving backwards were only 3 (3%) respondents. Respondents who continue to spray when the wind blew hard were 79 (79%) respondents, while respondents who sprayed in a way back and forth as many as 69 (69%) respondents. Respondents who does not use the full PPD can experiencing pesticides poisoning because pesticide particles might enter the body freely. That is why the PPE is important especially for spray farmers.

**CONCLUSIONS**

Health complaints that experienced by respondents were difficulty breathing (44%), eye and skin irritation (18%), weakness and fatigue (16%), headache (10%), and vomiting (2%). There is correlation between attitude with health complaint (P value = 0,019 and OR = 0,22), and there is correlation between respondent behavior with health complaint (P value = 0,014 and OR = 4,24). Poor respondent behavior had 4.24 times greater chance of health complaints than that of good. Farmers and communities need to read labels and instructions before using pesticides, as well as they need tu wear Personal Protective Equipment (PPE).

**Acknowledgement:** This research could be conducted very well by funding from PUPT, Indonesia.

**Ethical Approval:** The study was approved by the Universitas Indonesia Faculty of Public Health Institutional Review Board (IRB) with the letter number of 158/UN2.F10/PPM.00.02/2017.
**Competing Interest:** There is no competing interest or conflict of interest on this research article

**REFERENCES**

Service Excellence: Strategies for Healthcare and Nursing Services

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ABSTRACT

In the digital era, healthcare industry is evolved under conditions of intense competition in approaching health prevention, protection, and promotion. Healthcare organization especially nursing organization should adapt strategic planning of excellence (1) promotion and prevention excellence; (2) service excellence; (3) people excellence; and (4) governance excellence. Therefore, healthcare providers and nurses are challenged to always ensure better patient experience, winning patients’ satisfaction, and loyalty and remain competitive advantages.

Achieving service excellence is a potential factor for gaining competitive advantages in today’s healthcare industry. Sustained competitive advantage is the direct result of the value differential which a marked difference in clinical quality, service quality or price between other hospital services. As an executive, the job is to set a service strategy and enable staff to both innovate and continuously improve services. To achieve a service excellence, the healthcare and nursing organizations should start with components as followings; (1) creating and sustaining a culture of service excellence focusing on the six principles of service excellence, (2) leadership function and leadership roles for achieving service excellence, (3) strategies for achieving service excellence in healthcare with service-staff-system strategy, and (4) implementation of healthcare and nursing service strategies.

In conclusion, patients nowadays are systematically becoming aware of the diversity of their choices, being increasingly involved in making better healthcare choices, and, so, more and more innovative services are introduced. The all components of service product, service setting and service delivery system is not complete without patients. Achieving service excellence should be started with patient focus and everything ends with the patient as well.

Keywords: Service Excellence, Healthcare Strategy, Nursing Service Strategy

INTRODUCTION

In healthcare, the primary goal is to achieve a positive clinical outcome. The rest of the patient experience; however, often receives much less attention, to the detriment of all concern. Managing the total healthcare experience means ensuring that every component of care including the physical environment, organizational culture, healthcare clinician and staff behaviors, patient and healthcare team interpersonal relationship, communication system administrative policies, clinical protocol and standard of operation. The unique and multilayered players (e.g. physicians, nurses, regulatory agencies) in healthcare industry have cause healthcare organizations to pay less attention to their primary patients. However, medical or nursing managers have focused on reaching patients’ clinical needs, not their wants, needs.

In the present, the hospital seeks patient satisfaction ratings of 9 or 10 out of 10 by exceeding expectations for patient care delivery to assure maximum medicare reimbursement. Although congregations are not driven by the same imposed requirements for financial gain,
the concept of service excellence is transferable to the setting. Nursing strategic plans were carefully designed and specifically structured to lead to successful implementation of a shared leadership and a new nursing culture of excellence. Nursing excellence was further verified by achieving outstanding results in patient, physician, and nurse satisfaction scores and nurse retention.

**Definitions of Service Excellence**

Service excellence is both obtrusive and elusive. Service excellence in healthcare is difficult to define and better described as an “I know when I receive it, or perhaps more frequently, I know when I have not”. According to Robert Johnson (Institute of Customer Service), service excellence has four key elements: (1) delivering the promise of quality healthcare, (2) providing a personal touch, (3) doing a more than adequate job and (4) resolving problems well.

In order to achieve these elements, healthcare institutions, in particular, must be concerned with reducing the drivers of dissatisfaction, and providing exceptional healthcare. Schneider and Bowen demonstrated that “evidence indicates that satisfying customer is not enough to retain them because even satisfied customers defect at a high rate in many industries” satisfaction is a judgment. Delight is ‘an expression of very high satisfaction’; delight is a result of excellent service that exceeds expectations. “Exceeding expectations” implies that organizations have continually to do more in order to deliver excellent service and delight their customers. In conclusion, service excellence is the exceeding expectations compliance and anticipation exceeding standards accommodating and flexible subject matter expert, focusing on purpose, and customer loyalty.

**Creating and Sustaining a Culture of Service Excellence**

Establishing a culture of service excellence can be a catalyst for the service excellence strategy to move forward. Once service excellence is recognized as a valuable tool to improve the delivery of healthcare and nursing services, the next step is to assist each unit in finding methods to pursue nursing service excellence. To create and sustain a culture of excellence, the six principles of service excellence is a comprehensive approach to effectively improving the work environment, employee performance and the nursing service experience for patients all in one initiative.

**Principle 1: Vision and Mission Statement**

The vision/mission that are clear and simple and that every employee top-down within organization knows own and energizes. The vision statement should articulate for employee what the organization wants to be in 20 years. On the other hand a mission statement should clarify for employee who we are as an organization what is our purpose what legacy do we want to leave or even how we plan to achieve the vision and mission now.
Principle 2: Organization objective

The organization objective should be 3-4 primary key objectives and what that do for employee is it articulate how we do and what are our goals. The objectives should achieve the vision and mission; and employee understand exactly how their role and job performance.

Principle 3: Service standard

Service standard articulates for employees the actions and behaviors that they must demonstrate to bring the organization objectives the vision and mission to life every day.

Principle 4: Intervention and learning strategy

Intervention and learning strategy are those things that new employee orientation problem resolution grooming standards telephone etiquette those processes that directly impact the customer and what we do is help organizations determine where their gaps and then put interventions to close some of those gaps. The learning strategy is the strategic plan that maps out when we implement them throughout the organization’s consistently.

Principle 5: Organizational alignment

Organizational alignment looks at what is the communication strategy such as newsletters internet, social media whatever using to keep vision, mission, service standard alive re-energized, refocused, reinforced, re-emphasize. Organizational alignment is the strategy that helps us to put mechanism to repeat vision, mission and service standard every single day.

Principle 6: Measurement and leadership accountability

Measurement and leadership accountability is the key indicators measuring to determine and track how successful. Leadership accountability is going through all this laborious work creating and vision, mission, organizational objective, service standard that there are articulated and everyone understand them having processes in place to make them repetitious and consistent. Leadership accountability is addressing what mechanism the organization has in place to hold leader accountable for driving excellence.

Leadership function and leadership roles for achieving service excellence

To establish a culture of service excellence, the organization has to build leadership and develop a service excellence team. Leadership drives an organization; excellent leaders set the standard for everybody with their words and actions. At the same time, they bring out the best in people and encourage individual strengths. Commitment to service excellence by nursing manager should (1) create and instill a service excellence vision and an organizational climate conducive to the goals and principles of service excellence (2) ensure employees are trained and developed to give excellent service (3) facilitate and celebrate progress in service excellence goals (4) promote teamwork by building commitment to attaining the end-results and (5) communicate the success of service excellence to other departments, ministries, governments and to patients.

A great nursing manager is defined as someone who informs employees of what is expected of them; provides the necessary tools for works; allows employee to do what they do the best; recognizes, praises; cares about employee’s life; and encourages the professional growth and development of every employee. To be a great nursing manager for achieving service excellence, leadership functions should be as followings; (1) managing and overseeing division operations, (2) operating within budget, (3) hiring and managing employees, (4) attending meetings, (5) controlling costs and waste, (6) maintaining and improving worker productivity, (7) Handling internal/external conflict, (8) completing reports, and (9) maintaining safe work.

Also, leadership roles should be (1) inspiring, leading and motivating employees to achieve greater goals, (2) setting the vision and mission for the department or division, (3) being a mentor, coach and role model, (4) ensuring the team is aligned around a common purpose, (5) providing the direction, praise and recognition for a job well done, and (6) developing the skill and talent of nursing teams.

Strategies in healthcare and nursing services for achieving service excellence

The strategies for achieving service excellence in healthcare and nursing services can be divided into three parts of strategies as followings;
Part I: The Service Strategy

The service strategy is the set of plans for fulfilling the organization’s mission and vision, responding its values and culture, and reaching its goal. All services efforts are based on this strategy; the service strategies are including the three components of service product-setting and delivery system, the strategic planning process, environment assessment, quantitative and qualitative forecasting tools, evidence-based design and the healing environment, the customer-focused culture.

Part II: The Service staff

Staffing is the human resources activities that yield the personnel who develop, implement, improve and monitor the strategy including job analysis; recruitment, selection, and retention; leader and staff development; employee empowerment, motivation, and rewards; coproduction of healthcare and nursing services.

Part III: The Service system

System is referred to the processes, policies, standards, and other practices that support the strategy and the staff. The service system strategies are including health information system, blueprinting, fishbone analysis, and program evaluation reviews; waiting time and psychology of waiting; measurement and feedback methods; preventing service failure; and service excellence model.

Implementation of healthcare and nursing service strategies

The implementation of implementation in healthcare and nursing services for achieving service excellence that it is compound of three parts in 15 attributes as following:

Part I: The Service Strategy

Customer satisfaction as competitive advantage: Identifying and managing all aspect of the healthcare experience. Focusing on the customer, treating customers like guests. It is consists of four strategy activities which are (1) identifying the needs, wants, and expectations of patients, (2) creating a plan to overcome and reverse negative patient perceptions, (3) providing links of organization’s website to healthcare resources and related information, and (4) “Think retail” when developing service features.

The customer as a guest: Meeting or exceeding the quality and value that customer expect. It is consists of four strategy activities as (1) treat each patient like a guest, (2) study patients by research related to patients’ definition of quality and value, (3) designing memorable services, and (4) calculating the tangible and intangible cost of services.

Enhancing customer service through planning: Identifying and focusing on the key drivers of customer satisfaction in strategic planning. There are (1) performing an internal and external environment assessment, (2) considering the customer’s perception of quality and value when creating services, (3) developing action plans to implement the service strategy, and communicate those plans to all internal stakeholder, and (4) conducting alignment audit to ensure that all critical activities are in sync with the mission.

Creating a Healing Environment: Exceeding customer expectations regarding the healthcare setting in both reception and patient care areas. There are (1) envisioning and create the environment from the patient’s not the organization’s point of view, (2) pay equal attention to public area, (3) identifying nursing service system problems and improvements related to the positive practice environment, and (4) creating an evidence-based healing environment to convey and advance the organization safety, quality improvement, and patient satisfaction agenda.

Developing a culture of customer service: Defining and building a culture committed to providing superb service for all parts of the healthcare experience. There are (1) integrating beliefs and values into every aspect of nursing staff, (2) developing customer-focus beliefs and values, (3) creating reward systems and training programs, (4) adapting successful elements from other organizational cultures, (5) interacting with other nursing/healthcare networks, and (6) sharing stories of organizational legends and heroes.

Part II: The Service staff

Staffing for customer service: Finding and hiring clinical competent people who love to serve. The strategy activities are (1) empowering nursing staff to serve, (2) performing a thorough job analysis before undertaking the recruitment process, (3) assessing the attitudes and values of job candidates, not just their job skills, and (4) involving the entire team in the selection process.
Customer service training: Train employees, and then train them some more. There are (1) teaching employees in creative problem-solving techniques, (2) aware of training outcomes from patient expectation, (3) developing both leaders and staff for the organization’s future, and (4) making training and development in customer service an ongoing process.

Motivation and Empowerment: Motivating, empowering, and rewarding employee for achieving customer service goals. The strategy activities are (1) set clear, measurable standard that define expectations for job performance in all areas, (2) walk the talk as employee responds, (3) making all tasks and goals measurable, (4) pay attention to communication, (5) being fair, ethical, and equitable, (6) focusing on frequent, ongoing feedback geared toward improved job performance, (7) reward desired behaviors and identifies the types of rewards most desired, and (9) giving public reinforcement.

Involving the patient and family in coproduction: Empower patients and their families to help meet their own healthcare need. The strategy activities are (1) training nurses to coach, monitor, and supervise customers, (2) restructuring patient rooms to encourage family and friends to visit, and (3) motivating patients who derive value and quality from participation to coproduce.

Part III: The Service system

Communicating information internally and externally: Keeping the patient, family, and employee informed. The strategy activities are (1) learning the unique informational needs of each internal and customer and satisfy them, (2) making information available in a format that each customer expects ability to use, and feasibility, (3) put organizational information online but protect confident data, and (4) ensuring the information system generates and feeds back information for those who need it.

Delivering the service: Providing a seamless healthcare experience. There are (1) checking the system failure and service problem, (2) identifying and eliminate current policies, procedures, and rules that may impede customer services, (3) monitoring and maintain the quality of the service delivery system, and (4) designating the nursing staff position and responsibilities at each service.

Waiting for healthcare service: Managing all parts of the wait. The strategy activities are (1) managing the wait, do not just them happen, (2) knowing how long customer is willing to wait without becoming dissatisfied, (3) using queuing or waiting–ine models, and creating and implement performance standards for waiting times.

Measuring the quality of the healthcare experience: Measuring the important things, and then pursue the superb healthcare experience relentlessly. There are (1) focusing on the quality and outcomes of both clinical service and customer service, (2) using the combination of qualitative and quantitative method for measuring customer satisfaction, and (3) assessing the quality of service for both internal and external patients.

Fixing healthcare service failure: Eliminate all sources of disappointment positively and quickly. There are (1) realize that service-failure prevention, (2) train and empower nursing staff to find and fix problems, (3) train nursing staff to listen to dissatisfied- customers with empathy, then records the service problem and its solution, (4) address the root cause of service failure.

Leading the way to healthcare service excellence: Leading others to provide a superb healthcare experience. The strategy activities are (1) starting with customer-both internal patients and internal staff members, (2) articulating a vision, transcending to nursing staff, (4) build a strong customer service culture, (5) organizing staff to be trained and reward, (6) ensuring the job is fun, fair, and interesting to help employees provide superb experience, and (7) establishing a standard of performance.

CONCLUSION

Service excellence is a key factor for gaining competitive advantages in healthcare industry. The healthcare and nursing leaders blend the healthcare or nursing service strategy, staff and systems so everyone know they are supposed to concentrate on patients and other customers. Only when these components are all in place can the leader be effective in enabling and empowering employees. Only then can empowered employees provide the outstanding healthcare and nursing services that fulfill the organizational vision of providing remarkable service that exceeds patient expectations.
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Ethical Clearance: Not required

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Changing Rural Communities Behavior Towards Safe Water and Improved Sanitation in Indonesia

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ABSTRACT

Objective: To understand rural communities’ perception and attitudes on safe water and sanitation facilities. Additionally, provide evidence to showcase the impact access to safe water and improved sanitation facilities can have on rural communities.

Design: A case study with mix-method data collection through household surveys and focus group discussions (FGDs).

Setting: Two villages in Agam district, West Sumatera province, Indonesia, with contrasted performance on access to water and sanitation.

Participants: 227 household respondents, 7 FGDs and 15 in-depth interview informants.

Main outcome measures: To gain insight on respondents’ perception and attitudes toward safe water and improved sanitation, to design stages of behavioral change.

Results: Access to safe water and improved sanitation is not yet needed by rural communities due to insufficient information, nature condition, limited options for facilities, lack of reliable health workers and unclear policy. Behavioral change amongst community members requires more than awareness raising, it also needs planned activities, supplies and policy support with shared ownership between community and government.

Conclusions: Sanitarians are key stakeholders in rural water and sanitation. They hold important leadership in gradually changing rural people’s behavior towards safe water and improved sanitation.

Keywords: sanitarian, behavior change, sustainability, environmental health, evidence-based.

INTRODUCTION

Despite progressive access to rural water and sanitation (WASH), quality of facilities and services is very poor. The WHO/UNICEF’s Joint Monitoring Program 2017 recorded that currently no rural communities in Indonesia have access to safely managed WASH, 81% and 57% have access to basic service to water and sanitation.¹ By 2019, The Government of Indonesia (GoI) is determined to ensure the provision of 85% access to safe water and improved sanitation (SWIS) and 15% access to basic WASH to all population.² The GoI has set up a standard service for safe water which includes at least 60 liters/head/day,³ water quality that meets physical, biological, chemical and radioactive standards,⁴ is accessible 24 hours/day, and tariffs that do

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Phone: +6281299017688
not exceed 4% of customer’s income. The GoI has also set up an institutional mechanism to ensure provision of SWIS by local government and community. However, there are unclear procedures and insufficient resources, including availability of sanitarians, health workers responsible for water quality, to ensure application of this standard.

Data on the quality of WASH in rural Indonesia is insufficient. Statistics Indonesia conducted the first water quality survey in 2015, covering 940 households in Yogyakarta. It found that only 8.5% had access to safe water and 45.5% had access to improved latrines. Asian Development Bank study in 2016 found that only 6% of households with on-site systems had ever emptied their septic tanks due to poor construction. The lack of SWIS facilities lead to environmental-based diseases such as diarrhea, typhoid, and worms. It is important to provide more than just availability but quality access.

Communities, village government and sanitarians are critical to the provision of quality WASH in rural areas. In contrast with urban areas, delivery of rural WASH services is conducted by community and supported by the government through a number of programs such as Community-Based Water Supply and Sanitation Program (Pamsimas) and Community-based Total Sanitation (STBM). Sanitarians, working at community health center (puskesmas) oversee some villages and are responsible to observe, monitor, and empower communities to increase environmental quality, including WASH.

Little is known about Indonesian rural people’s perception and attitude towards SWIS. This study aims to capture their perceptions and attitudes, and to provide insight into design stages and options to create rural communities demand toward sustainable SWIS services.

METHOD

A case study was conducted in two villages with contrasting performances in WASH services provided by a Community-Based Organization namely BPSPAMS in Agam district. Both villages received a Pamsimas project, the Government’s main rural water program in Indonesia which was implemented in 2008, aimed at targeting 27,000 villages by 2020.

A high performance village was Silayang. In 2008, it was devastated by an earthquake that destroyed its irrigation facilities, which it heavily relied on for communities’ livelihoods. By 2011, the village achieved universal access to SWIS and Open Defecation Free status. It was located under puskesmas Lubuk Basung and has one sanitarian overseeing 47,000 people.

A poor performance village was Gumarang-1. Although there was no water scarcity, people relied on unsafe sources such as irrigation, rain water and unprotected wells. Piped water through BPSPAMS lasted about a year and stopped due to a number of social issues. There was insufficient data on access to improved sanitation, however the head of the puskesmas estimated less than 20% of population defecated in improved facilities in June 2017. The puskesmas oversees 18,000 people. The sanitarian position has been vacant since 2008 and the role was undertaken by a midwife.

Community perceptions and attitudes were collected through a random household survey. Using the Slovin method with 95% significant rate, there were 130 respondents in Silayang and 97 respondents in Gumarang-1. To enrich survey data, seven FGDs and 15 in-depth interviews were conducted. SPPS and NVIVO software were used for data analysis. Ethics approval was granted by the School of Environmental Science, Universitas Indonesia.

FINDINGS

Table-1 outlines respondents’ demographic information and access to WASH. All people in Silayang already have access to SWIS while less than half in Gumarang-1 have it. The FGDs found that Silayang’s community were more confident in the quality of their water compared to Gumarang-1’s. “It is piped directly from the mountain, looks clean and no one has ever been sick of drinking it”. “Of course it is not safe, looks turbid, we take it from irrigation. At least no one get sick”.

Table 1. Demographic and Access to WASH in Case Study Areas

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Silayang</th>
<th>Gumarang-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demography</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>People</td>
<td>1,068</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>Households</td>
<td>339</td>
<td>128</td>
</tr>
<tr>
<td>Sex (people)</td>
<td>Male (%)</td>
<td>19%</td>
<td>49%</td>
</tr>
<tr>
<td></td>
<td>Female (%)</td>
<td>81%</td>
<td>51%</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary: 6 years or less (%)</td>
<td>65%</td>
<td>43%</td>
</tr>
<tr>
<td>Income &lt;69 USD</td>
<td>Average/month (1 USD = IDR 14,500)</td>
<td>85%</td>
<td>51%</td>
</tr>
<tr>
<td>Disaster</td>
<td>Water scarcity</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Health worker</td>
<td>Sanitarian</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Village midwife</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Water supply (in person, n=227)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe source</td>
<td>Piped/BPSPAMS</td>
<td>128</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Ground well</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>Unsafe source</td>
<td>River, rain, or spring</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Bottled</td>
<td>1</td>
<td>37</td>
</tr>
<tr>
<td>Time</td>
<td>Water flows to home (0 minute)</td>
<td>125</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Dispatch water (return minute)</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Quantity</td>
<td>Average (liter/head)</td>
<td>100</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>Cannot estimate</td>
<td>124</td>
<td>56</td>
</tr>
<tr>
<td>Quality</td>
<td>No odor, no color</td>
<td>128</td>
<td>94</td>
</tr>
<tr>
<td>Solid and liquid waste</td>
<td>Waste disposal less than 10 meter from water source</td>
<td>5</td>
<td>79</td>
</tr>
<tr>
<td>cost/monthly (USD)</td>
<td>Average (1 USD = IDR 14,500)</td>
<td>1-2 USD</td>
<td>2-3 USD</td>
</tr>
<tr>
<td>Quality checking</td>
<td>Ever asking sanitarian, midwife or BPSPAMS</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sanitation (in person, n=227)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved facility</td>
<td>Own latrine with septic tank</td>
<td>123</td>
<td>12</td>
</tr>
<tr>
<td>Unimproved facility</td>
<td>Own latrine without septic tank</td>
<td>4</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Shared latrine</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Public latrine and open</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Pit emptying</td>
<td>Ever empty</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Author, 2018

Based on laboratory testing from four sites including, water sources and houses, water in both villages did not meet microbiology standards of 0 E. coli, however met most physical and chemical standards, except turbidity and pH in Gumarang-1. Respondents had local practice to filter and boil the water before drinking it except bottled water because they perceived it as safe, simple and economic.

The market for bottled water is rapidly growing. In 2010, nearly 30% of Indonesians used it as a primary source of drinking water and 4% living in rural areas, including 40% of respondents in Gumarang-1. There is insufficient education and action taken by health workers provided to communities and water vendors. The head of Gumarang-1 Puskesmas stated that they found bottled water sold in their areas did not meet standards, “but, we are unauthorized to take action.
Hence, we only encourage the water vendor to increase the quality of their water”. Department of Health is responsible for checking the water quality however actions toward business providers is the responsibility of trade department.

Some people in Silayang noticed that sanitarians came twice a year to take water samples. These results were announced during the BPSPAMS customers’ meeting. In Gumarang, due to the absence of a sanitarian, neither testing nor water treatment were conducted. The midwife had insufficient knowledge and skill on environmental health to undertake this role.

The Pamsimas project was started by triggering communities demand and behavior for improved latrines through STBM approach led by a sanitarian. In Silayang, 70% respondents (n=92) knew about STBM triggering and 73% (n=67) participated in it. In Gumarang, 88% respondents (n=85) knew about it however, only 48% (n=41) ever participated. Due to vacant sanitarian, STBM triggering was led by Pamsimas consultant.

**DISCUSSION**

**Perception and Attitude on Sustainable Safe Water and Improved Sanitation**

Using Principal Component Analysis (PCA), the study determines factors which build and influence perception and attitude on SWIS as seen in Table-2 and Table-3. There were 14 and 17 questions to measure perception and attitude respectively.

<table>
<thead>
<tr>
<th>Table 2. Perception on Safe Water and Improved Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception</td>
</tr>
<tr>
<td>KMO of sampling adequacy: .747</td>
</tr>
<tr>
<td>Bartlett test of sphericity: 661.739</td>
</tr>
<tr>
<td>Initial Eigenvalues</td>
</tr>
<tr>
<td>Component Total</td>
</tr>
<tr>
<td>Availability and delivery of access.</td>
</tr>
<tr>
<td>Financing and personnel</td>
</tr>
<tr>
<td>Expensive and unreliable service for improved latrines</td>
</tr>
<tr>
<td>Source: Author, 2018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3 Attitude on Safe Water and Improved Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
</tr>
<tr>
<td>KMO of sampling adequacy: .892</td>
</tr>
<tr>
<td>Bartlett test of sphericity: 1689.179</td>
</tr>
<tr>
<td>Initial Eigenvalues</td>
</tr>
<tr>
<td>Component Total</td>
</tr>
<tr>
<td>Citizen engagement in provision of water and sanitation triggering</td>
</tr>
<tr>
<td>Community contribution in BPSPAMS operation and sanitation behavior</td>
</tr>
<tr>
<td>Citizen engagement in BPSPAMS’ planning</td>
</tr>
<tr>
<td>Source: Author, 2018</td>
</tr>
</tbody>
</table>
Respondents perceive SWIS as a facility they can access every day. Safe water should be delivered by an organization to ensure the service’s standards and accountability while improved sanitation requires septic tank. Respondents perceive improved sanitation as an expensive facility with unreliable services that do not directly benefit their health. Gumarang-1 people thought that improved sanitation was not ecologically friendly. “There is a cycle in ecosystem, we feed fish with our dirt and they feed us. It is stupid and wasteful to buy fish pellet”.

The PCA categorized attitudes into three components: citizen engagement in water provision and sanitation triggering, community contribution for BPSPAMS’ operation and construction of improved latrines and citizen engagement in BPSPAMS’ planning. Citizen engagement is a binding commitment and shared responsibility between citizen and government. There are differing attitudes along service delivery priorities. Silayang people emphasize BPSPAMS’ operation and expansion, while Gumarang-1 focus on establishment of BPSPPS and sanitation triggering. Community knowledge on improved sanitation is quite high but motives to construct improved latrines are varied. Instead of becoming healthy, motive for people in Silayang was to get BPSPAMS’ water and to attract their urban family to visit home. West Sumatera or Minang tribe people adopt a migration culture (merantau) and do not go back home frequently.

Experience influences people’s perception and attitude. In many rural settings they are dominantly influenced by nature. Following earthquakes and water scarcity, experience, perception and attitude of the Silayang people was increasingly influenced by nature. With local conflict on service delivery, Gumarang-1 people’s perception and attitude was influenced by accountability of the service provider.

Creating awareness and convincing rural communities on the need for sustainable safe water and improved sanitation

Access to SWIS is not yet needed by rural communities because of insufficient information of SWIS, limited options to SWIS facilities, lack of reliable health workers and ineffective policy at the village level. Encouraging community members to demand a sustainable SWIS service requires a stage of behavior change. Adjusted behavioral change model developed by Prochaska and Dielemente and World Bank, the stage to convince people of SWIS’s importance appears as figure -1.

![Figure 1: Stages to create needs on safe water and improved sanitation](source: Author, 2018)

In short, steps sanitarians can take to convince rural people include:

- Provide simple and emotive information on SWIS, such as economic security and the relation between SWIS and environmental health.
- Engage village citizens in awareness raising activities to create ownership and to determine shared responsibility to sustain SWIS.
Institutionalize actions to maintain new behavior through sanitarians, village midwives, BSPAMS and formalize them into village and puskesmas policy.

Encourage local government to provide better access and affordable supplies to SWIS.

**CONCLUSION**

Quality access to SWIS is essential to prevent environmental diseases contamination and improved quality of life. Communities and government play critical roles to ensure sustainability of SWIS which is determined by people’s behavior and nature condition. Convincing rural people on the need for sustainable SWIS requires more than just raising awareness. People need to understand what SWIS is and why they need it, both cognitively and affectively. Reliable and affordable supplies and practical policy for SWIS are needed to respond to their demand for new behavior. Sanitarians are key stakeholders in rural WASH services. Their existence, skill and engagement should be ensured and continually strengthened.

This study adds on identification of rural communities’ perceptions and attitudes on SWIS, critical role of sanitation in collaboration with community and village government to sustain SWIS delivered through an accountable provider such as BPSPAM and insight into design and options to convince rural communities that sustainable service of SWIS is essential, for human and nature prosperity.

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Leptin and Cortisol: Relationships with Metabolic Syndrome in Male and Female Teachers

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ABSTRACT

Background: Increasing prevalence of metabolic syndrome causes the need for prevention of risk factors and markers, some of them are the role of leptin and cortisol. The aim of this study was to investigate the relationship between leptin and cortisol levels as risk factors of metabolic syndrome among men and women in the teacher group.

Method: A cross sectional study was performed with 86 teachers (16 men and 70 women). Characteristic sample, Anthropometry, Lipid profile, fasting blood glucose, blood pressure, cortisol and leptin were measured for all samples.

Results: Leptin levels are higher in women than in men (30.64±15.50 vs 7.87±6.02; p=0.005). While cortisol levels are higher in men than in women (12.09±4.94 vs 8.64±4.15; p<0.001). Age, stress levels, leptin and cortisol showed a significant association with metabolic syndrome. Leptin correlates significantly with High Density Lipoprotein/ HDL levels (r=0.391) for all samples. In men, leptin is significantly correlated with triglycerides/ TG (r=0.529) and systolic blood pressure (r=0.510), whereas in women, leptin correlates with abdominal circumference (r=0.479). Cortisol was significantly correlated with Fasting Blood Glucose/ FBG (r = 0.30) in all samples. In men cortisol was significantly correlated with Body mass index/ BMI) (r = 0.612 while in women it was significantly correlated with FBG (r = 0.328).

Conclusions: Leptin levels are higher in women than in men, but cortisol is higher in men than in women. In men, triglyceride levels and systolic blood pressure correlate with an increase in leptin, whereas in women is the abdominal circumference. In men, BMI correlates with cortisol and in women fasting blood glucose levels.

Keyword: markers, metabolic syndrome, leptin, cortisol

INTRODUCTION

Non-communicable diseases (NCD) cause the death of 40 million people each year, equivalent to 70% of deaths globally. The highest causes of death were vascular disease, chronic lung cancer, diabetes, and other NCD (44,25%; 22%; 9,75%; 4%; and 20%)1. Of this amount, 85% are in developing countries, one of which is Indonesia.

One of the main risk factors for NCD is metabolic syndrome2. The main parameters are blood glucose level, abdominal circumference, blood pressure, HDL levels, and triglyceride levels3. Several markers were then developed to detect an increased risk of metabolic syndrome including cortisol and leptin4,5.

The hormone cortisol is a hormone that is associated with stress, not only in negative conditions, but also...
in a comfortable and happy condition. Chronic stress is associated with hypercortisolism and long-term sympathetic nervous system (SNS) activation that results in fat accumulation, especially in the abdomen. Excess fat in the abdomen is one of the parameters of the metabolic syndrome. Identifying risk factors for cortisol is important for stress management as an effort to prevent metabolic syndrome.

Leptin is commonly known as the obese gene. People who are obese have high leptin levels. Leptin is identified as a regulator in regulating body weight. Errors in transportation can cause leptin resistance and cause obesity. A literature review shows that of several markers available, leptin is an appropriate biomarker to identify metabolic syndrome.

Research on metabolic syndrome in Indonesia is still very limited. The results of the analysis of the Riskesdas data 2007 conducted by Nurhaedar Jafar showed that the prevalence of metabolic syndrome was 5.2% which increased along with the increasing prevalence of obesity. Research on leptin and cortisol as a marker of metabolic syndrome has never been done before in Indonesia. This study aims to determine the relationship between differences in levels of leptin and cortisol in men and women, the influence of risk factors on metabolic syndrome and risk factors that correlate with leptin and cortisol in men and women in the teacher group.

Method

The study with a cross-sectional study design was conducted on a group of teachers in Makassar City. This study involved 12 selected schools and was part of a cohort study, educating teachers as an effort to prevent metabolic syndrome.

The number of samples that can be analyzed for this study is 86 people (16 men and 70 women). Demographic characteristics (age and sex), stress levels were measured using a questionnaire through interviews with respondents. Interview and measurement of anthropometry (weight, height, waist circumference/WC) was carried out by trained personnel taken from undergraduate nutrition students public health faculty of Hasanuddin University. Blood collection is carried out by the prodia laboratory.

Metabolic syndrome

Metabolic syndrome is defined using criteria from the results of harmonization of several groups in the world. The following are the limits for determining the risk of metabolic syndrome parameters.

- HDL levels, risk if <40 mg/dl male and <50 mg/dl female
- Triglyceride levels, risk if ≥ 150 mg/dl
- Glucose blood sugar levels, risk if fasting blood glucose levels ≥ 100 mg/dl
- Blood pressure, risk if ≥ 130/85 mmHg
- Abdominal circumference, risk if > 90 cm for men and > 80 cm for women

Blood samples were taken after fasting respondents for 12-14 hours were taken by medical personnel from the Prodia laboratory. HDL examination is carried out by Homogenous Enzymatic Colorimetric Assay method, examination of triglycerides by using enzymatic colorimetric method, whereas fasting blood glucose examination using the Hexokinase method. Blood pressure was measured in the condition of the respondent being seated, and being relaxed using Mercurial Sphygmomanometer.

Leptin and cortisol

Leptin and cortisol were measured using the enzyme immunoassay test method. Reagents used in the Diagnostic Biochem Canada Inc brand, where cortisol uses reagents with Ref can-C-270 and leptin using reagents with Ref: can-L-4260. Leptin and cortisol examinations were carried out at the Hasanuddin University Hospital Laboratory.

RESULT

Characteristics of samples based on sex can be seen in Table 1. The average age of male samples is higher than women (50.81 vs 48.89) but the stress level in women is higher than in men (29.00 vs 27.56). There are differences in anthropometry in men and women (p<0.001). There are differences in levels of leptin and cortisol in men and women (p<0.001 and p=0.005). Fasting blood glucose and triglyceride levels do not show the difference between men and women. However, there are significant differences in HDL levels, systolic blood pressure, diastolic and abdominal girth, where women are better than men.
The relationship between how many risk factors for MetS can be seen in table 2. The risk factors for age and stress are higher in respondents who experience MetS than those who are only at risk (consecutive p=0.010 and p=0.026). All MetS parameters show a meaningful relationship with MetS (p<0.05) as well as levels of the hormone leptin and cortisol. Respondents who have lower levels of leptin are at risk of developing metabolic syndrome (p=0.016) and respondents who have higher cortisol levels are at risk of developing metabolic syndrome (p=0.014). The relationship of MetS risk factors stratified based on sex can be seen in table 3. There were significant differences in age, systolic blood pressure, fasting blood glucose levels, triglyceride levels, HDL levels, between men and women in respondents who experienced metabolic syndrome.

The relationship between leptin and cortisol in several MetS risk factors and MetS parameters can be seen in Table 4. Leptin hormone is significantly associated with HDL levels and abdominal circumference (p<0.05) while cortisol hormone is significantly associated with fasting blood glucose levels (p<0.001).

### Table 1. Characteristics of Samples Based on Sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=16)</th>
<th>Women (n=70)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean±SD)</td>
<td>50.81±3.89</td>
<td>48.89±5.79</td>
<td>0.210</td>
</tr>
<tr>
<td>Stress level (Mean±SD)</td>
<td>27.56±4.77</td>
<td>29.00±8.28</td>
<td>0.506</td>
</tr>
<tr>
<td>Anthropometry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight (Mean±SD)</td>
<td>73.37±6.48</td>
<td>59.69±5.87</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>height (Mean±SD)</td>
<td>166.20±5.61</td>
<td>153.05±5.51</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BMI (Mean±SD)</td>
<td>26.57±1.99</td>
<td>25.49±2.23</td>
<td>0.081</td>
</tr>
<tr>
<td>Hormone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leptin (Mean±SD)</td>
<td>7.87±6.02</td>
<td>30.64±15.50</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cortisol (Mean±SD)</td>
<td>12.09±4.94</td>
<td>8.64±4.15</td>
<td>0.005</td>
</tr>
<tr>
<td>MetS parameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FBG (Mean±SD)</td>
<td>99.81±25.41</td>
<td>94.46±22.95</td>
<td>0.411</td>
</tr>
<tr>
<td>TG (Mean±SD)</td>
<td>176.81±94.95</td>
<td>135.14±67.70</td>
<td>0.113</td>
</tr>
<tr>
<td>HDL (Mean±SD)</td>
<td>42.06±7.51</td>
<td>58.16±10.90</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Systole (Mean±SD)</td>
<td>130.00±12.65</td>
<td>119.71±12.74</td>
<td>0.005</td>
</tr>
<tr>
<td>Diastole (Mean±SD)</td>
<td>85.63±6.29</td>
<td>81.00±7.45</td>
<td>0.024</td>
</tr>
<tr>
<td>WC (Mean±SD)</td>
<td>93.42±3.30</td>
<td>86.66±5.06</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*Sex difference are using T test

### Table 2. Mets Risk Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mets (n=24)</th>
<th>Risk Mets (n=62)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>51.21±3.39</td>
<td>48.48±5.99</td>
<td>0.010*</td>
</tr>
<tr>
<td>Stress</td>
<td>31.71±12.01</td>
<td>27.58±4.94</td>
<td>0.026*</td>
</tr>
<tr>
<td>BMI</td>
<td>26.29±2.21</td>
<td>25.46±2.19</td>
<td>0.122</td>
</tr>
<tr>
<td>WC</td>
<td>89.99±5.57</td>
<td>87.11±5.23</td>
<td>0.027*</td>
</tr>
<tr>
<td>Systole</td>
<td>130.42±15.17</td>
<td>118.23±10.79</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Diastole</td>
<td>84.58±8.84</td>
<td>80.81±6.60</td>
<td>0.034*</td>
</tr>
<tr>
<td>FBG</td>
<td>113.58±34.06</td>
<td>88.44±11.99</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>TG</td>
<td>198.46±84.08</td>
<td>121.39±58.50</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>HDL</td>
<td>46.08±10.26</td>
<td>58.68±10.90</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Leptin</td>
<td>19.46±12.49</td>
<td>29.09±17.50</td>
<td>0.016*</td>
</tr>
<tr>
<td>Cortisol</td>
<td>11.17±5.04</td>
<td>8.54±4.07</td>
<td>0.014*</td>
</tr>
</tbody>
</table>

*P < 0.05  **P < 0.001
Table 3. Mets Risk Factor by Sex

<table>
<thead>
<tr>
<th></th>
<th>Male (n=10)</th>
<th>Female (n=14)</th>
<th>Male (n=6)</th>
<th>Female (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>50.40±4.11</td>
<td>51.79±2.77*</td>
<td>51.50±3.73</td>
<td>48.16±6.13</td>
</tr>
<tr>
<td>BMI</td>
<td>27.01±1.97</td>
<td>25.77±2.31</td>
<td>25.83±1.99</td>
<td>25.42±2.23</td>
</tr>
<tr>
<td>WC</td>
<td>93.62±3.74</td>
<td>87.41±5.29</td>
<td>93.08±2.69</td>
<td>86.47±5.04</td>
</tr>
<tr>
<td>Systole</td>
<td>136±11.74*</td>
<td>126.43±16.46*</td>
<td>120.00±6.33</td>
<td>118.04±11.19</td>
</tr>
<tr>
<td>Diastole</td>
<td>86.00±6.99</td>
<td>83.57±10.08</td>
<td>85.00±5.48</td>
<td>80.36±6.59</td>
</tr>
<tr>
<td>FBG</td>
<td>101.50±31.37</td>
<td>122.21±34.34*</td>
<td>97.00±12.23</td>
<td>87.52±11.69</td>
</tr>
<tr>
<td>TG</td>
<td>212.10±103.80*</td>
<td>188.71±69.29*</td>
<td>118.00±31.88</td>
<td>121.75±60.85</td>
</tr>
<tr>
<td>HDL</td>
<td>38.80±6.32*</td>
<td>51.29±9.43*</td>
<td>47.50±6.35</td>
<td>59.88±10.64</td>
</tr>
<tr>
<td>Leptin</td>
<td>10.09±6.59</td>
<td>26.16±11.42</td>
<td>4.18±2.06</td>
<td>31.76±16.26</td>
</tr>
<tr>
<td>Cortisol</td>
<td>12.69±5.52</td>
<td>10.08±4.55</td>
<td>11.08±4.04</td>
<td>8.28±4.01</td>
</tr>
</tbody>
</table>

*P < 0.05

**P < 0.001

Table 4. Correlation Table Between Leptin and Cortisol With Mets Risk Factors and Mets Parameters

<table>
<thead>
<tr>
<th></th>
<th>Leptin</th>
<th>Cortisol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (n=16)</td>
<td>Women (n=70)</td>
</tr>
<tr>
<td>Stress</td>
<td>-0.263</td>
<td>-0.083</td>
</tr>
<tr>
<td>Spiritual</td>
<td>-0.069</td>
<td>-0.178</td>
</tr>
<tr>
<td>Age</td>
<td>-0.226</td>
<td>-0.021</td>
</tr>
<tr>
<td>FBG</td>
<td>0.172</td>
<td>-0.150</td>
</tr>
<tr>
<td>TG</td>
<td>0.529*</td>
<td>-0.032</td>
</tr>
<tr>
<td>HDL</td>
<td>-0.212</td>
<td>0.180</td>
</tr>
<tr>
<td>Sistole</td>
<td>0.510*</td>
<td>-0.008</td>
</tr>
<tr>
<td>Diastole</td>
<td>-0.078</td>
<td>0.107</td>
</tr>
<tr>
<td>WC</td>
<td>-0.074</td>
<td>0.479**</td>
</tr>
<tr>
<td>BMI</td>
<td>0.420</td>
<td>0.050</td>
</tr>
</tbody>
</table>

*P < 0.05

**P < 0.001

**DISCUSSION**

This study shows the relationship between levels of leptin and cortisol with metabolic syndrome in teachers who are distinguished by sex. Leptin levels are higher in women than in men. In the group that experienced the MetS and risk of MetS, female respondents had higher levels of leptin than men. Leptin hormone levels are associated with obesity. Research conducted in Korea shows that serum leptin is associated with metabolic syndrome, especially in the body mass index12. A meta-analysis conducted by Zeng, et al showed that there was a relationship between leptin and an increased risk of heart and stroke13.

Leptin is a hormone associated with regulating food intake and energy balance14. Leptin is closely related to the level of obesity, where obese people also have higher hormone levels than those who do not obese15. This
study showed that the average abdominal circumference and BMI of men were higher than women, however, based on the results of the analysis it was seen a positive correlation with the increase in levels of leptin hormone with abdominal circumference in women. The higher the abdominal circumference, the higher the level of leptin hormone. This study is in line with research conducted in Saudi Arabia, where leptin levels are higher in women and are positively correlated with BMI and abdominal circumference16.

The hormone cortisol shows a significant relationship with the metabolic syndrome, where respondents who experience metabolic syndrome have higher cortisol levels than those at risk. Hormone cortisol is higher in men than in women, as well as in respondents who experience Mets and are at risk of MetS, men have higher cortisol levels than women. This is the same as research conducted by Esteghamati, et al in Tehran, which shows high levels of serum cortisol in men compared to women after being justified by age, BMI, and abdominal circumference17. High cortisol levels are strongly associated with a person’s stress level7.

The hormone cortisol can be a marker of the metabolic syndrome. One mechanism that shows the relationship between metabolic syndrome and cortisol is hypothalamic-pituary-adrenal (HPA) active in respondents who experience Mets. One of the active activities of HPA is due to sustained levels of stress 4. One of the factors associated with stress is work18.

In this study, stress showed a significant relationship with the metabolic syndrome, but did not show a significant relationship with cortisol levels. A meta-analysis was conducted on 29 cross sectional studies by Pan, et al. Which showed that respondents who experienced higher stress had a higher prevalence of metabolic syndrome than those who experienced less stress19. Some mechanisms that can show this relationship are obesity20, the occurrence of inflammation21 and an increase in oxidative stress in respondents who are obese22.

**CONCLUSION**

Leptin levels are higher in women than in men, but cortisol levels are higher in men than in women. Increased parameters of the metabolic syndrome also increase levels of leptin and cortisol, but there are different parameters that increased in men and women. This study strengthens that the hormone leptin and the hormone cortisol are markers for the determination of the metabolic syndrome.

**Conflict of Interest:** There is no any conflict of interest within this study and publication

**Ethical Clearance:** Taken from Hasanuddin University Ethics Committee with number: 969/H4.8.4.5.31/PP36-KOMETIK / 2017.

**Source of Funding:** Ministry of Research, Technology and Higher Education, Indonesia.

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Awareness of Obstructive Sleep Apnea among University Students in Malaysia

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¹Head of the Unit, Otorhinolaryngology, ²BMS, ³Head of the Unit, Biochemistry, International Medical School, Management and Science University Shah Alam Malaysia

ABSTRACT

Background and Aims: Obstructive sleep apnea (OSA) is a sleep disorder which causes intermittent stoppage of breathing. This sleep disorder can lead to excessive daytime sleepiness, snoring and interferes with day to day work. In Malaysia obesity is prevalent in younger generation and lack of awareness of this disorder may contribute to increase in number of obstructive sleep apnea cases in future. Therefore, the aim of this research is to evaluate the level of knowledge and awareness of obstructive sleep apnea among the student community of a private Malaysian university.

Materials and Method: A cross sectional study design was employed and the subjects were selected by convenience sampling. Data was collected using self-administered questionnaires The questionnaire consisted of part A which focused on the socio-demographic profile and part B for awareness and knowledge of OSA. An informed consent was taken from all the participants.

Result: 133 of participants (38%) could correctly elaborate the abbreviation OSA. 91 (26%) were able to correctly list at least one risk factor of OSA. 101 (29%) were able to correctly list out at least one symptom while 63 (18%) could correctly list out at least one complication of this condition. 63 (18%) could correctly select at least one method of diagnosing OSA and 56 (16%) could correctly list out at least one treatment option for OSA.

Conclusion: The knowledge and awareness of OSA is poor among the student community. Awareness of this condition should be raised through social media and campaign.

Keywords: Obstructive Sleep Apnea, awareness, students.

INTRODUCTION

Obstructive sleep apnea (OSA) is a condition in which there is temporary cessation of breathing during sleep characterized by repetitive episodes of partial or complete upper airway obstruction. This situation causes the diaphragm and chest muscles to work harder to open the obstructed airway. Various studies have emphasized on the adverse effects of this condition the likelihood of hypertension, cardiovascular disease, stroke, daytime sleepiness, fatigue, motor vehicle accidents and diminished quality of life. OSA can impair the individual’s cognitive function which leads to deficits in executive functions, attention and memory. The risk factors for this condition include obesity, alcohol intake, smoking, nasal congestion and estrogen depletion (as in menopause). Continuous positive airway pressure (CPAP) is the treatment choice for OSA as it improves daytime function and may positively improves cardiovascular function.

In recent years, overweight and obesity have been the two major concerns in relation to Malaysians’ health. The National Health and Morbidity Survey (NHMS) statistics in the year of 2011 indicated the prevalence
of overweight and obesity among Malaysian youths 18 and 19 years old categories was 14.1% and 9.9%, respectively and their corresponding rates reportedly rose to 18.1% and 10.8% among young adults aged 20 and 24 years old (Institute of Public Health, 2011). OSA is more common among obese patients. The mechanism involved is mechanical obstruction by density of the fat around neck during sleeping. A similar research conducted in Singapore revealed poor level of awareness and knowledge about OSA in the general population. Hence, this study was conducted with an aim to assess the awareness and knowledge of OSA among university students in Malaysia.

MATERIALS AND METHOD

Study design

This is a cross sectional study conducted at a private university in Selangor, Malaysia with the sample being drawn from the student community of the university.

Sampling method and sample size

For sampling method, this study uses the convenience sampling by selecting those people who are available at the time. The sample size was calculated using single population proportion. Thus, \( n = \frac{z^2 \times p (1-p)}{e^2N} \)

Where; \( N = \) Population size, \( e = \) Margin of error (as a decimal) \( z = \) Confidence level (as a z-score) \( p = \) prevalence of respondent, from previous research (Alexandria University Faculty of Medicine) Thus, \( n = 350 \)

All students who are above 19 years of age and studying in university in Selangor Malaysia were included in this study.

Study Instrument used:

A questionnaire was developed after an extensive literature search. The original questionnaire was developed in the English language in order to maintain consistency with questions adapted from references with and without modifications. This questionnaire was designed with multiple choice questions. It was designed keeping in mind the population, time duration to answer and literature search. It consisted of questions regarding the definition, risk factors, symptoms, complications, diagnosis and treatment of obstructive sleep apnea. The questionnaire was pilot tested on 25 randomly selected university students to determine if there was an ambiguity in the wording. The questionnaire was accordingly modified and later administered to the participants.

Ethical Consideration

Consent form was written on the front page of the questionnaire and an informed consent was taken from all the participants of the study. Ethical clearance was sought from the institution’s ethical committee.

Data Collection and Statistical analysis

The questionnaire was distributed to the students who are spotted in the campus during their leisure time. Informed consent was obtained from all the participants. After compiling the data, the information was analyzed by using IBM Statistical Package for Social Science (SPSS) version 23. The descriptive statistics namely percentage was used in presenting the results of study.

RESULT

This study was conducted on 350 individuals studying in a private university in Malaysia. 217 were males and 133 were females. All the participants were in the age group of 20-30 years. 185 (53%) were pursuing degree, while 161 (46%) studying in diploma courses and 4 (1%) were in master’s program.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answered Correctly</th>
<th>Answered Incorrectly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Definition</td>
<td>133 (38%)</td>
<td>217 (61%)</td>
</tr>
<tr>
<td>Q2 Risk Factors</td>
<td>91 (26%)</td>
<td>259 (74%)</td>
</tr>
<tr>
<td>Q3 Symptoms</td>
<td>101 (29%)</td>
<td>249 (71%)</td>
</tr>
<tr>
<td>Q4 Complications</td>
<td>63 (18%)</td>
<td>287 (82%)</td>
</tr>
<tr>
<td>Q5 Treatments</td>
<td>56 (16%)</td>
<td>294 (84%)</td>
</tr>
<tr>
<td>Q6 Diagnosis</td>
<td>63 (18%)</td>
<td>287 (82%)</td>
</tr>
</tbody>
</table>
In the present study, only 133 of respondents (38%) were able to correctly elaborate the abbreviation of OSA as obstructive sleep apnea. This signifies that most of them had never heard of this term.

**Awareness and knowledge of risk factors of OSA**

In the present study, 91 of the respondents (26%) were able to correctly identify the risk factors of OSA while a vast majority 259 respondents (74%) selected wrong risk factors or a combination of wrong and correct risk factors.

**Awareness and knowledge of symptoms of OSA**

The correct response regarding the symptoms was observed in 101 (29%) while 249 respondents (71%) wrongly answered this question.

**Awareness and knowledge of diagnosis of OSA**

Most of the respondents had no idea about how this condition was diagnosed. 63 (18%) correctly answered this question while 287 (82%) of participants incorrectly answered this question.

**Awareness and knowledge of complications of OSA**

The complications related to OSA include cognitive dysfunction, hypertension, stroke, and mood disorder. The criteria for correct answer is respondent’s ability to select at least one of the complications. Of all the participants, 63 (18%) could respond correctly by identifying one of the complications of OSA.

**Awareness and knowledge of treatment for OSA**

The correct options provided for this question were application of continuous positive airway pressure (CPAP) and reducing body weight. The criteria for correct answer is participant’s ability to pick up at least one treatment option. We observed that 56 (16%) of the participants could correctly answer while 192 (84%) incorrectly answered this question.

We found 42 (12%) of the respondents could correctly answer all the questions of the questionnaire.

**DISCUSSION**

A study revealed that Malaysia has the highest number of overweight individuals at 45.3% of its population followed by South Korea (33.2%), Pakistan (30.7%), and China (28.3%). It showed that 49% of women and 44% of men in the country were obese. An interesting and unexpected observation that has emerged is that, while Asians are less obese than Caucasians, the prevalence of the disease in the East is almost as much as in West. Moreover, for a given age, sex, and BMI, Asians have greater disease severity than Caucasians. The greater severity of OSA among Asians is attributed to the differences in the craniofacial features between Asians and Caucasians. As OSA is one of the sequelae of obesity and daytime sleepiness is one of the consequences of OSA, this study was conducted to assess awareness of this condition among the university student population.

Based on the data we collected, only 133 of the respondents (38%) were aware of this condition and were able to define Obstructive Sleep Apnea correctly. The prevalence of sleep apnea tends to increase with age. Our study population were in the age group of 20-30 years and this could contribute to the lack of awareness of OSA among them. In a previous similar research conducted on the general population in Singapore through telephonic interview regarding awareness of Obstructive Sleep Apnea showed 170 out of 1306 respondents able to elaborate OSA correctly reflecting poor knowledge of this condition.

Most of the respondents in our study did not possess sufficient knowledge of the condition mainly regarding risk factors, diagnosis, treatment and complications of OSA. Only 42 respondents (12%) were able to answer all the questions correctly. In our study, 38% could correctly define OSA, 26% could identify at least one risk factor, 29% could identify at least one symptom, 18% were aware of the complications and method of diagnosis of OSA while only 16% had knowledge of treatment options for this condition. Our findings were better than the results reported by a similar study in Singapore where a total of 77 (5.9%), 158 (12.1%), 150 (11.5%), and 110 (8.4%) respondents were able to correctly list out at least one risk factor, symptoms, complications and treatment option for OSA respectively. This may be attributed to the educational status of our study population when compared to the general population of the previous study.

The level of education however did not correlate with the level of knowledge regarding OSA in our study. Only one out four students doing master’s program was
able to demonstrate full awareness and knowledge of OSA. It is not surprising as a study conducted by Reuveni H et al. on primary care physicians in Israel also reported inadequate knowledge of OSA among physicians. A similar study among health professionals and medical students in South India about OSA being an established and modifiable risk factor for hypertension and ischemic stroke also concluded about the poor level of knowledge about OSA.

**CONCLUSION**

Our study shows that university students in general are not aware of Obstructive Sleep Apnea and the complications it can lead to. The result is expected due to similar findings from previous studies in other countries. As this study was conducted on young university students having normal BMI, most of them were asymptomatic. This maybe one of the reasons they were unaware of this condition in spite of the educational status of our study population. As obesity is prevalent in Malaysia, a similar study in future on the general population would be more beneficial. The results of this study however throw light on the importance of educating the general public and creating an awareness of this condition.

**Conflict of Interest** – Nil

**Source of Funding** – Nil

**Ethical Clearance** - Obtained

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Learning Model in Nursing Education

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ABSTRACT

Lecturing process in educational nursing institution needs several strategies and innovations in overcoming students’ learning barrier and increasing the output quality of nursing students. This research is trying to develop a learning model at the educational nursing institution using a various concept of the learning model. This research is explanatory using the population of nursing students across South Borneo. The sample were taken with Proportional Random Sampling with total 178 nursing students. The data gathered are analyzed with CFA and Partial Least Square (PLS) test model. Student learning model at educational nursing institution is built upon student’s achievement and learning motivation whereas the motivation is affected by the lecturer’s character and learning barrier that student has. In order to achieve optimal quality of learning, the nursing students must have a support to raise their independence and activity in the learning process.

Keywords: Learning model, Student, Nursing education

INTRODUCTION

Nursing students in lecturing process usually have fluctuated achievement which is connected with learning barrier that affects students’ learning motivation. Both student’s and lecturer’s character also have roles in student’s learning motivation which will affect student’s affective and cognitive achievement. Nursing students in Health Polytechnic of Banjarmasin feel physical exhaustion at the end of campus activities which is 58.2% either in lectures or practice, they also feel less enthusiastic with the lecture which is 43.1%.

Data result of Nursing Competence Test from Ministry of Research, Technology, and Higher Education in September 2015 showed no Educational Nursing Education in South Borneo that has 100% passing rate; even though Poltekkes Banjarmasin has a passing rate of 98.6%.

Learning Model from Klein et al. (2006) showed that Course Outcome of students both affectively and cognitively is correlated with learning motivation, perceived barriers, and both student’s and lecturer’s characteristics. This research aimed to develop a learning model for Educational Nursing Institutions.

MATERIALS AND METHOD

This study was explanatory research which explains various factors correlated between nursing student character, lecturer’s character and learning barrier as exogenous variable that can affect endogenous variable consists of student’s motivation and learning result where the connection between this factor will form a learning model for Nursing Educational Institution in South Borneo. The population in this research was Nursing Student Diploma in every Educational Nursing Institution in South Borneo with the total sample of 178 students that was acquired with proportional random sampling.

Data was acquired by distributing the questionnaires to every nursing student that had been explained about this research’s aim before. The respondents didn’t need to fill their names and asked to fill the questionnaire as honest as possible.
**FINDINGS**

The first phase is to analyze/evaluate the item reliability of test model PLS on its loading factor (standardized loading). The second phase in evaluating a concept model is to evaluate variables’ reliability by observing Cronbach’s Alpha score and Composite Reliability score or Constructive Reliability. The last phase of model analysis is to analyze the model test to acquire the answer the research’s hypothesis by observing Path Coefficient score. The result acquired from Statistical Analysis is Concept Model of Learning of Nursing Student in South Borneo as constructed below:

**DISCUSSION**

Influence of Lecturer’s Character on Learning Barrier

Nursing students oftentimes experience learning barrier in various forms such as ineffective learning method, less learning time and clinical practice, inability to apply research result in nursing practices, language barrier, communication in learning process and other barriers to reach achievement in both academic and clinical practices where lecturer’s role is needed to overcome this learning barrier\(^{(2–6)}\). According the analysis result of pathway, test shows that there is an influence of Lecturer’s character toward learning barrier in nursing students in nursing major of Health Polytechnic of Banjarmasin. This is corresponding to the concept that was submitted by\(^{(3)}\) that Lecturers have an important role in overcoming Learning Barriers that students have in lectures.

Lecturers’ role is very helpful in overcoming students’ Learning Barriers from the environment, the students’ cognitive condition, and students’ habits, which will hopefully increase students’ achievement\(^{(7)}\). A quality lecturer is competent and good in both physically and mentally. Lecturers are demanded to have a communicational skills to interact with students by involving and respecting students in the learning process; always creative, following the recent development of science and technology and respecting the difference on students\(^{(8–11)}\).

A quality lecturer will motivate and increase the knowledge of students where the transfer of knowledge will be easily conducted and effective in learning the nursing theory and practical skills\(^{(9,10,12)}\).

Nursing education in South Borneo is obsolete, where the students must have a face to face learning with the lecturers. This traditional method would certainly cause the overwhelming feeling, take too much time and thus create learning barrier. In order to overcome this learning barrier, the lecturer must use several learning methods and stimulate students’ critical thinking\(^{(3)}\).

Nursing lecturers are demanded to help students’ self-esteem because it will help them to overcome the learning barrier. Lecturers’ skill to be a role model is important to initiate a good communication between the lecturer and the students. Various professional Nursing workshop and socialization can be given to students in order to solve the conflict that the students have in their minds and it will help them in nursing clinical practice environment\(^{(2)}\).

Influence of Lecturer’s Character on Learning Barrier

The analytic result from Pathway test shows that there is an influence of Lecturer’s character toward students’ learning barriers in Educational Nursing Institution on South Borneo. This condition is corresponding with Concept Model from Klein et al. (2006) which explains that an interesting character of a lecturer includes a good method for transferring knowledge. In class instruction, generally, students follow learning activity in the same place and have a face to face interaction with the lecturers. Lecturer’s Proximity theory shows that lecturer’s communication skill to involve both verbally and non-verbally with the students will improve the learning motivation and experience; lecturers play an important role in the outcome of a teaching-learning interaction. The interaction between lecturer and students and learning control of knowledge transfer will improve Nursing students; learning motivation\(^{(1,13)}\).

Lecturer-student interaction with a humanistic and
Communicative character and understanding with the value that students have will have an effect on students learning motivation. Interaction aspect may probably the most important thing. Uniting lecturer’s character, the method of learning, and the students’ characters is the thing that influences motivation. A student that learns is more sensitive to the lecturer’s learning method.

Influence of Learning Barrier on Nursing Students’ Motivation

The analytic result from Pathway test shows that there is an effect of learning barrier toward learning motivation in Nursing students in South Borneo. This condition is suitable with the concept that Klein et al. (2006) explained the perception of learning barrier is felt by the students in the learning situation, learning environment, and the learning process itself. The objective barrier that the students felt for instances are the insufficient time, material, or information in the lecture. Learning barrier both perceptively and objectively will influence the students' intention or learning aim and directly will affect the effort that comes from the motivation to improve achievement, affiliation needs, and power needs.

Learning barrier must be solved because it can become a crucial and hard to be prevented when it already happens. The various condition will influence teaching-learning process and balance; because they are correlated (interrelation) and bipolar activity. Process in Pedagogy education demands a condition that has a correlation between learning barrier and learning motivation.

Influence of Motivation on Learning Result

Need for achievement is a push to overcome barrier, to achieve, and act more to reach a higher standard in a competition. This need constituted by one’s willingness to manage or lead the others. It consists of 2 kinds of needs for power, which are personal power and social/institutional need. People will be happy to have power upon all things, that they chase upon everything, and relational need is interpersonal need that is modest and close in organizational environment. The third motivation is Affiliation need that reflects the desire to interact socially to people. In other words, Affiliation need is the need for social relation in working environment. One with high affiliation need place the quality of personal relation as an important thing.

Motivation becomes important because motivation shows how students’ self-efficacy quality on comfort and persistence is needed in improving students motivation and motivation shows how nursing students are able to surpass various challenge in education process. Support or motivation directs individuals to struggle harder to get personal achievement than to get a reward. This, in turn, cause them to do something that is more efficient than before. A projective technique is used to measure one’s motive to achieve. Basically, this technique tries to ensure how far one’s original mind can become ideas that oriented to achievement. For instance, if one writes a story based on a picture that is shown, then we can count the number of ideas of the story that has relation to achievement. This simple count than can be used as a score of the need for achievement, that reflects one’s support to achieve or to score the motivation to achieve. A projective technique that is defined above is a part of the early situation about the need for achievement.

Parental culture and nurturing pattern will influence the level of need for achievement of Nursing students besides being influenced by environmental factor either in campus or outside the campus such as the online community.

Lecturer factor can improve the understanding and responsibility since there is a collaboration between the lecturer and the students. Lecturers must improve the teaching method that is effective and improve their knowledge of interaction with the students since it will improve students’ motivation. Correlation between the factor that influences motivation can either strengthen or weaken motivation of the students as the subject of Nursing education.

Affective achievement is an important score point to emphasize and strengthened in Nursing education. Educational Nursing Institutions need to observe the students’ affective skills because later in the practical field the students will interact directly with patient that has real life emotion and feeling that not only notice the logical problem and cognitive skills. The Affective domain must be constantly developed in health care including in nursing care either in hospital or community nursing. Learning of this domain will improve internalization and commitment that is shown with emotion, interest, behavior, values, and faith where they will be needed in approaching the patient.
A nursing research is conducted with hope to produce new discovery that can help to contribute either for science and improvement of nursing care. The research result can be described as follows:

Learner character is not significantly influencing either Perceived Barrier or Learning Motivation. This discovery is supported by the researchs\cite{13,32–34}.

GPA that use the cognitive scoring as the measurement of learning achievement is not valid and can be biased if used to measure the quality of student. Bias can happen because of fake rewards from the lecturer where it can fog the objective scoring that students meant to get. This problem is conveyed by\cite{35,36} and suggested to be prevented as early as possible. The lecture is nursing education must improve their knowledge about the thorough and comprehensive clinical evaluation. Lecturers are also demanded to implement the effective and objective method and undertake clinical evaluation that is formative and summative. Also, the weight of work for the lecturers must be revised. Therefore, effective and comprehensive evaluation for Nursing students clinical competence is needed.

**CONCLUSION**

Nursing education in South Borneo is built upon the lecturers’ character that influences nursing students’ learning barrier and learning motivation where a good approach on their motivation may improve their achievement either in the class lectures or clinical and practical field in hospital or community.

**ADDITIONAL INFORMATION**

Ethical approval: yes, conflict of interest: no, Self funding: yes.

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Effect of Low Methionine Formula on Levels of IL-1β Serum and IL-1β Gene Expression in Knee Joint Cartilage Tissues of Normal Rabbits and ACL Induction OA Models

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ABSTRACT

Methionine deficiency is an environmental factor can degrade the quality of the bone, cartilage and modulate chondrocytes to increase protease secretion and change gene expression. The aim of the study was to determine the effect of methionine deficiency on IL-1β serum, expression of IL-1β in cartilage tissue of knee joints of New Zealand rabbit’s (Oryctolagus cuniculus). The experimental animals were divided into 6 treatment groups: normal group with the addition of DL-methionine 0.25%, normal group with the addition of DL-methionine 0.15%, normal group with the addition of DL-methionine 0.00%, ACL group with the addition of DL-methionine 0.25%, ACL group with the addition of DL-methionine 0.15%, ACL group with an addition of 0.0%. Examination of IL-1β serum by ELISA with RayBio Rabbit commercial kit. Examination of IL-1β expression immunohistochemically using IL-1β anti-rabbit primary antibody with a Santa Cruz commercial kit (Sc7884). The results were analysed using one way ANOVA, followed by LSD. The results indicate that methionine deficiency (DL-methionine 0.0%) is able to increase IL-1β serum. The expression of IL-1β in knee joint cartilage tissue appears to be increased significantly through the metabolic effects or interactions with biomechanical changes. Methionine deficiency has the same ability in normal and pathological conditions, has a tendency to increase IL-1β serum and IL-1β gene expression in joint cartilage tissue.

Keywords: Methionine deficiency, IL-1β serum, IL-1β expression, Knee joints cartilage

INTRODUCTION

Methionine as an essential amino acid in the body’s metabolic cycle has the ability at several control points including in protein synthesis, DNA / RNA synthesis, genetic expression, trans-methylation and fat, carbohydrate metabolism. Inadequate nutritional intake when conditions require high nutrient levels will sharply increase the risk of micronutrient deficiency and can interfere with growth in adolescence and will increase the risk of degenerative diseases in old age.

One of the degenerative diseases is osteoarthritis (OA) which can cause chronic disability and have serious health impacts, especially in the elderly. Osteoarthritis is a multifactorial disease caused by genetic and non-genetic risk factors or environmental factors such as age, obesity, injury, mechanics, metabolic disorders and endocrine. Through different molecular and cellular mechanisms, various risk factors cause changes in the expression of cytokine, proteinase, extracellular matrix proteins in cartilage to form the pathogenesis of osteoarthritis. Interleukin-1β (IL-1β) is the main pro-inflammatory cytokine that plays a role in catabolic processes that induce cartilage...

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damage, decrease proteoglycan synthesis, collagen and increase aggrecan secretion and stimulate chondrocytes to produce matrix metalloproteinase (MMPs) enzymes. 

IL-1β adheres to the receptor on the surface of chondrocytes and synoviocytes causing transcription of MMPs genes so that enzyme production increases. Increased production of MMPs, especially MMP-13, can mediate the degradation of type II collagen and aggrecan proteoglycans.

Methionine is known as precursor in the formation of cysteine was the main source of sulphate for sulphatation reactions for synthesis of glycosaminoglycan, proteoglycan. Sulfation of extracellular matrix macromolecules is very important to maintain the quality of cartilage. The loss of extracellular matrix proteoglycans is an early sign of osteoarthritis.

Decreased proteoglycans cause the extracellular matrix to dehydrate, decrease the ability to withstand loads. This causes chondrocytes to increase protease secretion and degeneration of cartilage tissue. The hypothesis of this study is that methionine deficiency can increase IL-1β serum and increase IL-1β expression in cartilage of the knee joint of normal rabbit and rabbit model OA.

MATERIALS AND METHOD

Methionine deficiency formula

The methionine deficiency formula was prepared at the Food Technology Laboratory of the Health Department of Malang. It was formulated using a mixture of local food ingredients in the same amount and composition as cornmeal, soy flour, polar, vegetable oil and salt, minerals, vitamins. Methionine used in the form of DL-methionine and added to the formula with a dose of 0.25%, 0.15% and 0.0% per 1 kg of formula. The nutrient contain of the three DL-methionine formulas is the same, protein (12.9%), fat (8.7%) and carbohydrates (65.4%).

Animals Model OA

Female, white, 4-6 months old, New Zealand rabbits (Oryctolagus cuniculuc) from Modern Rabbit Farming of Batu Animal Husbandry Department were used as an animal model ACL. All procedures were performed on the approved research protocol by the Ethics Committee of Faculty of Medicine, Universitas Brawijaya (Number:372/EC/KEPK/09/2016). As an Anterior Cruciate ligament incision model (ACL) conducted by a team of veterinary surgeons from Animal Clinic of Central Animal Husbandry Training (BBPP), Center Batu, East Java.

Design

The rabbits were divided into 6 groups: normal rabbits with DL-methionine 0.25%; normal rabbits with DL-methionine 0.15%; normal rabbits with DL-methionine 0.0%, ACTL rabbit normal rabbits with DL-methionine 0.25%; normal rabbits with DL-methionine 0.15%, 0.15% DL-methionine 0.0%.

Measurement of intake

DL-methionine intake was measured every day (g/day/rabbit). It was calculated by dividing the total intake by 35 days.

IL-1β serum

IL-1β serum was measured using ELISA, and performed according to commercial kit instruction (Ray Bio Rabbit IL-1β, ELL-IL-1β). A 50µl blank and standard solution were put into empty wells. A total 50µl of serum each sample and put into the wells and incubated in at 37°C, covered with thin-foil wrap for 30 minutes. The solution was rinsed 4 time with PBST, added 50 secondary antibody conjugated with HRP and incubated once more in 37°C, covered with wrap for 30 minutes. After 15 minutes of 37°C incubation stop solution (in NaOH) was added and ELISA plate was read at 450 nm wavelength.

The expression of IL-1β

Immunohistochemistry was used to measure IL-1β expression in joint cartilage. Using a commercial kit (Santa Cruz ((Sc7884)) with polyclonal anti-rabbit primary antibody IL-1β. The procedure following the manufacturer’s protocol. Observation of chondrocytes was carried out using a BX51 (Olympus) microscope on 400 x objective magnification.

Statistic analysis

All data obtained were expressed as mean ± standard deviation, then analyzed using ANOVA and Post Hoc test with LSD test.
FINDINGS

Intake of Methionine Formula

In normal rabbits the average food intake was different between treatments, low methionine intake was more than other treatments. Induction of ACL intake low methionine did not increase food intake, intake of food was lower although statistically insignificant (table 1).

Table 1. Mean Intake of Methionine Formula per day

<table>
<thead>
<tr>
<th>DL- metionine</th>
<th>n</th>
<th>Intake of Normal Rabbit</th>
<th>p-value</th>
<th>Intake of ACL Rabbit</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean ± SD*(g/day)</td>
<td></td>
<td>Mean ± SD*(g/day)</td>
<td></td>
</tr>
<tr>
<td>DL-metionin 0.25% per 100g</td>
<td>4</td>
<td>60.20 ± 1.73a</td>
<td>0.00</td>
<td>76.86 ± 0.82</td>
<td>0.14</td>
</tr>
<tr>
<td>DL-metionin 0.15% per 100g</td>
<td>4</td>
<td>66.59 ± 2.46b</td>
<td></td>
<td>74.12 ± 2.76</td>
<td></td>
</tr>
<tr>
<td>DL-metionin 0.0% per 100 g</td>
<td>4</td>
<td>77.67 ± 0.94c</td>
<td></td>
<td>73.58 ± 2.59</td>
<td></td>
</tr>
</tbody>
</table>

Note: * Duncan test results show if mean ± SD there are different letters then there is a meaningful difference and if it contains the same letter there is no difference.

IL-1β Serum

In general, there was no difference in serum IL-1β levels between treatments. Although it was not statistically significant, low methionine intake in normal rabbits had a slightly higher IL-1β serum level compared to other rabbits. Induction of ACL increases serum IL-1β levels.

Table 2. Concentration of IL-1β serum of rabbits

<table>
<thead>
<tr>
<th>Formula of methionin</th>
<th>n</th>
<th>IL-1β concentration (µg/dl) Rabbit Normal</th>
<th>Sig</th>
<th>IL-1β concentration (µg/dl) Rabbit ACL</th>
<th>Sig'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean ± SD*</td>
<td></td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>DL-methionine 0.25% per 100 g</td>
<td>4</td>
<td>0.20 ± 0.10a</td>
<td>0.00</td>
<td>0.23 ± 0.04a</td>
<td>0.00</td>
</tr>
<tr>
<td>DL-methionine 0.15% per 100 g</td>
<td>4</td>
<td>0.15 ± 0.00b</td>
<td></td>
<td>0.14 ± 0.03b</td>
<td></td>
</tr>
<tr>
<td>DL-methionine 0.0% per 100 g</td>
<td>4</td>
<td>0.22 ± 0.01c</td>
<td></td>
<td>0.24 ± 0.02c</td>
<td></td>
</tr>
</tbody>
</table>

Note: * One way Anova results, followed by post hoc test using LSD s different letters indicate a significant difference.

Expression of IL-1 β

Expressions of IL-1β in cartilage of the knee joint between treatments was a significant differences. Low methionine intake in normal rabbits IL-1β expression was higher than other rabbits. ACL induction increases IL-1β expression in cartilage of the knee joint, although it was not statistically significant.
Table 3. Average IL-1β expression in rabbit knee joint cartilage tissues

<table>
<thead>
<tr>
<th>Formula DL-methionine</th>
<th>n</th>
<th>Expression of IL-1β normal rabbit</th>
<th>Expression of IL-1β ACL rabbit</th>
<th>p-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean ± SD*</td>
<td>Mean ± SD*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DL-methionine 0.25% per 100g</td>
<td>4</td>
<td>3.75 ± 1.50a</td>
<td>6.25 ± 0.96c</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>DL-methionine 0.15% per 100g</td>
<td>4</td>
<td>12.25 ± 0.96b</td>
<td>9.00 ± 0.82b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DL-methionine 0.0% per 100 g</td>
<td>4</td>
<td>15.25 ± 0.96c</td>
<td>15.75 ± 1.26c</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *One way Anova results, followed by post hoc test using LSD.

Note: a,b,c different letters indicate a significant difference.

Figure 1. Expression of IL-1β by immunohistochemical method (400 x enlargement) appears brownish in the cytoplasm of cells, using stained DAB.

Note 1:
A. The preparation of cartilage of the rabbit's knee joint is normal
B. Cartilage preparation of ACL rabbit incision knee joints

Note 2:
1. DL-methionine formula 0.25%
2. DL-methionine formula 0.15%
3. DL-methionine 0.0%
DISCUSSION

Nutritional deficiency or imbalance of nutrients is one of the environmental factors that can affect cartilage health. Methionine as an essential amino acid is known to have a very important role for growth and development\(^{(13)}\). Several studies have proven that reducing methionine in the diet can prolong life span, induce changes in energy metabolism, weight loss\(^{(14)}\). In the group of normal rabbits which were given a low methionine formula, more food intake was compared to the control rabbit group (DL-methionine 0.25%). In another study the same results, in adult mice that were given methionine (DL-methionine 0.0%) diet for 6 months increased food intake. According to Hasek, animals fed a low methionine diet would consume more food than animals fed a control diet (0.86% methionine)\(^{(15)}\).

An imbalance of amino acids can cause a reduction in the flexibility of the food consumed. According to Harper, methionine is one of the amino acids that has the ability to eat from other amino acids. So that deficiencies and excess of methionine intake have a large impact on food consumption. Several previous studies have shown that methionine restriction diets (DL-methionine 0.0%) can increase the flexibility of metabolism and energy use or glucose during normal conditions\(^{(15,16)}\). So limiting methionine in normal conditions can increasing energy use and energy expenditure\(^{(17)}\). Changes in plasma amino acid concentrations can physiologically contribute to conditions of malnutrition and inflammation, low methionine intake has been shown to be involved in inflammatory responses and oxidative stress\(^{(18)}\). In the elderly, interleukin-1 plays a role in normal homeostasis and the inflammatory response that is responsible for the development of chronic diseases such as osteoarthritis\(^{(19)}\). In this study giving a low methionine formula (DL-methionine 0.0%) gave a minimal effect on inflammation. Supported by several other studies that show that increased IL-1β in serum occurs in diseases associated with metabolic syndromes such as atherosclerosis, chronic heart failure and type 2 diabetes, 1 and autoimmune diseases and rheumatoid arthritis\(^{(20,21)}\).

IL-1β works by binding to specific receptors on the cell membrane, initiating cascades that cause induction and increase or inhibit various immune responses\(^{(22)}\). Interleukin-1β has the effect of increasing the secretion of MMPs including MMP-13, suppressing type II collagen synthesis, inhibiting TGF-β which serves to stimulate chondrocyte proliferation, matrix synthesis\(^{(18,23,24)}\).

In this study normal rabbits which were given a low methionine formula had IL-1β expression in the knee joint cartilage higher than normal rabbits which were given enough methionine formula (DL-methionine 0.25%) (p <0.05). This shows that low methionine intake has the potential to initiate and improve the development of osteoarthritis. In the posttraumatic phase there is an increase in inflammatory mediators that cause acute inflammation resulting in homeostasis and metabolic imbalances\(^{(25)}\).

Under conditions of low methionine intake, causing the synthesis of glycosaminoglycan (GAG) including proteoglycans, chondrocytin sulphate the extracellular matrix component of cartilage becomes obstructed\(^{(26,27)}\). Reducing the synthesis of glycosaminoglycan or proteoglycans will change the structure and composition of extracellular matrices to cause changes in biosynthesis and chondrocyte activity which are the beginning in the pathogenesis of osteoarthritis\(^{(28,29)}\). Interleukin -1β (IL-1β) can induce matrix metalloproteinase (MMP) enzymes which can degrade various components of extracellular matrix such as collagen, proteoglycans in physiological and pathological conditions\(^{(30)}\). Chondrocytes secrete matrix metalloproteinase-13 (MMP-13) in response to interleukin-1 (IL-1).

Limitations

This study was carried out in the short term to determine the effect of intake of methionine deficiency on catabolic gene expression in normal knee joint cartilage tissue and the OA damage model was not significantly different. Further research is needed with a longer period of time and more samples to determine differences in the effects and mechanisms of methionine deficiency on the expression of catabolic and anabolic genes in knee joint cartilage in normal weight or obese human or experimental animal models.
CONCLUSION

This study shows that methionine deficiency has the same ability in normal and pathological conditions, has a tendency to increase IL-1β serum and increase IL-1β gene expression in knee joint cartilage tissue.

ADDITIONAL INFORMATIONS

The funding of this research was obtained from the Ministry of Health of the Republic of Indonesia. Before the implementation in the field, ethical clearance was obtained from Ethical Committee of Brawijaya University, Number: 372/EC/KEPK/09/2016. There is no conflict of interest relating to this research activity.

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Pseudo National Security System of Health in Indonesia

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ABSTRACT

Indonesia’s national health insurance program requires participants to contribute every month. After paying, participants have the right to obtain a single identity and benefit from health services. The service of the Health of Social Insurance Administration Organization still has some problems that are experienced by Health BPJS participants. The problem were rejected by the hospital, the claim value of BPJS was lower than the real value of health care costs, limited medicines and also the JKN system which was still limited in benefits. The concept and implementation of JKN itself is an effort to move the burden of JKN financing which is the state’s obligation to citizens with sanctions. JKN actually becomes an additional burden for citizens and the state should take the largest portion of JKN financing. The Indonesian JKN system itself is a pseudo social security.

Keywords: Health insurance, Pseudo national security system

INTRODUCTION

The implementation of social security for all Indonesians is actually the state’s obligation. National Social Security System (SJSN) brings new hope for the realization of social welfare for all Indonesian people(1). Law Number 40 concerns on SJSN which contains the concepts that is in line with the constitution that compulsory social security for all residents including National Health Insurance (JKN). This means that every citizen has the right for social security when they are sick(2). The implementation of national health insurance as part of the national social security system is managed by a government agency called the Social Security Administering Agency (BPJS)(3).

BPJS has a representative office in the Province and branch offices in the districts. BPJS is responsible for receiving registration and managing data of JKN, collecting JKN contributions, managing JKN funds, financing the health services and paying JKN claims(4).

SJSN that is held should be a form of the role of the state in overcoming various problems faced by the community(5). The state in this case precisely delegates the role of organizing the national social security system to a public agency, namely BPJS. BPJS is a legal entity formed to organize a health insurance program specifically commissioned by the government(6).

Health services are entitled to all citizens. Indeed, any disturbance, intervention or injustice, indifference, whatever its form, which results in an insecurity of the human agency, its psyche, natural environment and social environment, its regulation and laws, and the injustices in social management that they receive, are violations of their rights, human rights(7).

The social security program prioritized to cover the entire population first is a health insurance(8). The principle of the health insurance program in Indonesia formulated by Law Number 40 of 2004 concerning SJSN. One of social insurance principle is a compulsory fund collection mechanism that comes from contributions to provide protection for the socio-economic risks that happened in participants and or their family members. As for the principle of equity, each participant who pays contributions will receive health services comparable to the contributions paid(9).

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Indonesia’s national health insurance program requires participants to contribute every month. After paying, participants have the right to obtain a single identity and benefit from health services (10).

The obligation to join JKN as explained in Article 16 paragraph (1), at the same time followed by the threat of sanctions for those who violate. Article 17 paragraph 1-3 of the BPJS Law states “(1) ... Every person who does not implement the provisions referred to in Article 16 is being the subject of administrative sanctions (2). Administrative sanctions as referred to in paragraph (1) can be in the form of: a. written warning; b. fine; and / or c. do not get certain public services. (3) Imposition of sanctions as referred to in paragraph (2) letters (a) and (b) are carried out by BPJS. (4) Imposition of sanctions as referred to in paragraph (2) letter (c) shall be carried out by the Government or regional government at the request of the BPJS. (5) Further provisions concerning the procedure for imposing administrative sanctions are regulated by Government Regulation (11).

Sanctions do not get certain public services for citizens who do not attend JKN explained in the explanation of the BPJS Law. The explanation is on Article 17 Letter (c). The BPJS Law states that, “What is meant by” certain public services “include processing business licenses, building permits, proof of ownership of land and building rights.”

Social Insurance Administration Organization Participants who are in arrears in payment are being the subject of 2% of fine for late payment which then complies with the new regulation in the Perpres number 28 of 2016 which is changed into 2.5%. Important to remember, JKN participants can benefit from JKN having to fulfill their obligations first. Participants who do not pay regularly (delinquent) will also be subject to sanctions. The new National Social Security System in the health sector can be active after the people are forced to pay dues (12).

The problem is “Why is the Indonesian National Health Insurance referred to as the national pseudo social security?”

**MATERIALS AND METHOD**

This study used a mixed method (13) with a connected normative or doctrinal juridical approach. The approach in this study were: conceptual, statute, comparative and socio-legal approach. Tashakkori & Teddie as quoted by Susanto stated that a diverse paradigm approach can serve as a basis for carrying out research. Dialectic means rejecting the selection/prioritization of one paradigm above another paradigm. This dialectic means not favoring another paradigm, but rather looking at research with mixed methods or approaches as intentional involvement/application of various devices and their assumptions. According to this view all paradigms are valuable world views, but only partially so there is no problem using multi methods or mixed methods (14).

**FINDINGS AND DISCUSSION**

Indonesia’s national social security system is a social security program that affects hundreds of millions of Indonesians. The national social security system implemented by BPJS cannot be said to be a real social security because of some quite fundamental problems. Researchers have a proposition that JKN as part of SJSN that is managed by BPJS which is not a real social security system, but a pseudo social security system.

The concept of the national social security system is managed by the government (15) through BPJS has been in accordance with the conception of the social security system that is actually desired by the constitution. The state develops a social security system for all people and empowers people who are weak and unable to meet the dignity of humanity (16). The practice of JKN turns out to regulate an insurance scheme that requires all citizens to take part in social security on the health insurance aspect.

The constitution has ordered that the National Social Security system is an obligation of the state and as such, essentially the implementation of JKN in Indonesia by the BPJS transfers the burden from the government to citizens (17). In the National Social Security System in the field of health and employment which is applied in the empirical praxis of citizens, it is given an additional burden in the form of compulsory contributions. Fees are paid by each person every month. The contribution system applied in JKN is a real effort to move the burden of implementing JKN to citizens.

The low state budget for Indonesia’s health is one indicator of the government’s low commitment and the weakness of the health policy. This low commitment with a limited budget is certainly not strong enough to cover the implementation of the social security system.
that is the duty of the state so that a solution is needed to cover it. The solution is to move the burden by requiring people to join the BPJS with the insurance paradigm (paying regular premiums).

The application of JKN has an insurance paradigm is a real effort from the government to move the burden of the social security system to citizens. In an ideal condition of citizens are still given an additional burden to pay health social security contributions with the threat of sanctions.

The philosophy of social security must not be mixed with insurance principles. The provisions of the SJSN Law and BPJS Law say about the obligation to pay contributions to the participants. This is being a consideration form of social insurance which is required by the state. According to Salamuddin Daeng, a researcher from the Indonesian Political Economy Association (AEPI) stated that “If social security should not use contributions.

The application of the paradigm and insurance system in the social security policy implementation of the social sector is the answer to the low allocation of government health funds which is only worth less than 5%.

The government does not seem to distinguish between the social insurance system and the social security system. The application of the paradigm and insurance system in national social security is certainly not in accordance with the concept of a social security system which essentially aims to provide protection and social welfare for all Indonesians.

Another problem is that it takes a few days before the benefit package has been paid and they got a Health BPJS card. This makes citizens not think that they do not get full benefits, especially regarding the benefits of being a Health BPJS participant. They cannot access benefits from JKN in the event of health problems. Participants should not have to wait seven days to be served with a benefit package through health services. The sickness cannot be limited to seven days after becoming a participant. Citizens also need services at any time if they are sick.

It is very clear that in activating this benefit of BPJS actually does not suitable with human principles. Citizens who get sick but have not become BPJS participants yet are having difficulties with this policy. They will not be able to access JKN unless after the activation period. It is very possible in case of emergency they will die first or not handled well before the JKN activation period. The JKN activation policy a few days after registration actually violates the law as well as being unfair in this case because it should be registered so that you can immediately access JKN. This kind of pattern is not a characteristic or principle of social security that should be.

The principle that characterizes the social security system is, first, the social security program grows and develops in line with the economic growth of a country. This is related to increasing community needs. It is in line with increasing demands in the welfare sector. Social security programs develop first in formal groups, then non-formal. In many countries, the implementation of social security is carried out centrally by the state. The reason is that social security is a non-private public domain. Some countries that practice this include America, Britain, Australia, Malaysia, the Philippines and others. Some indicators show that the social security system is a public domain that must be implemented by the state.

Why does the state choose to impose the implementation of JKN on citizens by charging. The transfer of the burden is through a mandatory contribution paid by the citizen even though it should be the responsibility of the state. The state budget allocation in the APBN to be compared with other countries, spending on social security in Indonesia is very small. The field of social security that is implemented is also still very limited.

Social insurance is a different thing because there is a role for participants to participate in financing through either social insurance or savings mechanisms. This is despite for the fact that the contribution fee can be a burden for the giver and recipient of work (for formal workers), and of the participants themselves for groups that are independent and capable.

The social insurance mechanism is the backbone of social security funding in almost all countries. The amount of the contribution is associated with the income level to ensure that all participants are able to contribute.

The concept of JKN is a pseudo social security
(in the legislation is referred to social security). JKN implementation is referred to social insurance so that the state can impose its financing on citizens. The state only provides two trillion rupiah for the establishment of BPJS. From this point of view, it is actually seen that through the Social Insurance Administration Organization, the Government intends to release its responsibilities as a national health insurance provider.

The concept of social security, social insurance is really overturned in the implementation of Indonesia’s national health insurance. Social security is a macro policy tool to correct inequality distribution by providing assistance to a weak economy or disadvantaged people. Social security should not be enough. It is only the rhetoric of social rights but it is a legal right in basic legal instruments.

**CONCLUSION**

JKN implementation in Indonesia can be called a pseudo national health insurance. In real terms the guarantee is carried out by citizens, for citizens and funded by citizens with the BPJS as a mere implementing agency. The state was not present in financing and JKN in Indonesia and chose to form BPJS as the state’s representative in the implementation of BPJS. The burden of implementing JKN is fully charged to citizens while the state is free from hand, even though the juridical development of the social security system is the implementation of the social service function of the state.

**ADDITIONAL INFORMATIONS**

**Conflict of Interest:** No

**Ethical Clearance:** Yes

**Source of Funding:** authors

**REFERENCES**


The Effectiveness of Clinical Supervision Model Based on Proctor Theory and Interpersonal Relationship Cycle (PIR-C) toward Nurses’ Performance in Improving the Quality of Nursing Care Documentation

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ABSTRACT

Background: Consistent clinical supervision though affects the working performance of nurses, in implementation is often neglected within the setting of developing country of Indonesia. Clinical supervision models of Proctor theory and interpersonal relationship cycle (PIR-C) are made to increase the quality of nursing care documentation.

Methods: The research aims to identify the effectiveness of clinical supervision models based on Proctor theory and interpersonal relationship cycle (PIR-C) toward the nurse performance in improving the quality of nursing care documentation. This research was used as a pre-test post-test experiment involving 100 respondents selected with cluster sampling. Partial Leas square (PLS) was used to examine the factors affecting clinical supervision models of PIR-C while the Wilcoxon Signed Rank Test was used to test the effectiveness of clinical supervision models based on Proctor theory and interpersonal relationship cycle (PIR-C).

Results: The clinical supervision models of PIR-C significantly can improve the quality of nursing care documentation.

Conclusion: This model is recommended to implement in the hospital to enhance the quality of nursing care documentation

Keywords - Clinical supervision, effectiveness, Proctor theory and interpersonal relationship cycle (PIR-C), nursing care, documentation

INTRODUCTION

Clinical supervision involves a supportive relationship between supervisor and supervisee that facilitates reflective learning and is part of professional socialization (1). The model of nursing clinic supervision in Indonesia is unclear as to what and how is the implementation in the hospital. Up to this point, it has not yet known the appropriate and practical model that can be applied (2). Proctor’s supervisory model is a useful model for implementation and evaluation strategies that provide success in the supervision process (3). Proctor’s (4) three-function interactive model has gained increasing popularity in nursing and is probably the most frequently cited supervision model in the UK. Proctor’s supervision model is the only supervision model that already has internationally validated instruments (3). The clinical supervision model based on Proctor Theory and interpersonal relationship cycle (PIR-C) emphasizes the organizational, work characteristic, and individual factors (5) whereas the supervision area is based on the three domains - normative, formative, and restorative (4) and the increasing relationship quality between the
supervisors and the supervisees by implementing the four steps of orientation, identification, exploration, and resolution (6). The individual factor variable was influenced by some factors, such as capability and psychological characteristics. The organizational factor variable is controlled by elements of reward, leadership, training and development, and the structure of an organization. The work characteristic factor variable is affected by the actual performance and feedback factors(7).

This research purpose is to get descriptions the effectiveness of the clinical supervision model based on Proctor theory and interpersonal relationship cycle (PIR-C) toward to nurse performance in improving the quality of nursing care documentation in public hospital located in Surabaya, the second big cities of Indonesia. The result of developing this model is expectedly to increase the quality of nursing care documentation in the hospital’s wardrooms.

**METHODOLOGY**

This research used a quasi-experimental pre-post test with the complete sampling of 200 nurses in two government hospitals in Surabaya, Indonesia taken each 100 nurses. Their mean age was 27 years (22-30), and 156 (78%) were female, and 44 (22%) were male. 120 nurses (60%) had experience of work more than ten years, 30 (15%) knew work more than three years, and 50 (25 %) had involvement of work more than 15 years. Path analysis with Partial Least Square was used to test the effect of clinical supervision model based on Proctor theory and interpersonal relationship Cycle (PIR-C) toward nurses’ performance in improving the quality of nursing care documentation. The data collection was done by the way the questionnaire and observation. The population to bring up this strategic issue is by giving a survey to evaluate the clinical supervision implementation that modified from Manchester Clinical Supervision Scale, an interpersonal relationship from Peplau nursing theories(8) and checklist for evaluation and observation the nursing care documentation in the hospital ward room.

**RESULTS**

Prior research suggests that a sample size of 100 to 200 is usually a good starting point in carrying out path modeling (9).

The result summary for reflective outer models is presented in Table 1.

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>Indicators</th>
<th>Loadings</th>
<th>Indicators Reliability</th>
<th>Average Variance Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Ind_1</td>
<td>0.853</td>
<td>0.727</td>
<td>0.768</td>
</tr>
<tr>
<td></td>
<td>Ind_2</td>
<td>0.900</td>
<td>0.810</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>Org_1</td>
<td>0.594</td>
<td>0.352</td>
<td>0.513</td>
</tr>
<tr>
<td></td>
<td>Org_2</td>
<td>0.809</td>
<td>0.654</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Org_3</td>
<td>0.632</td>
<td>0.399</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Org_4</td>
<td>0.806</td>
<td>0.649</td>
<td></td>
</tr>
<tr>
<td>Work Characteristics</td>
<td>Work_1</td>
<td>0.862</td>
<td>0.743</td>
<td>0.801</td>
</tr>
<tr>
<td></td>
<td>Work_2</td>
<td>0.927</td>
<td>0.859</td>
<td></td>
</tr>
<tr>
<td>Supervision</td>
<td>Sup_1</td>
<td>0.847</td>
<td>0.717</td>
<td>0.517</td>
</tr>
<tr>
<td></td>
<td>Sup_2</td>
<td>0.736</td>
<td>0.541</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sup_3</td>
<td>0.542</td>
<td>0.293</td>
<td></td>
</tr>
<tr>
<td>Documentation</td>
<td>Doc_1</td>
<td>0.680</td>
<td>0.462</td>
<td>0.558</td>
</tr>
<tr>
<td></td>
<td>Doc_2</td>
<td>0.791</td>
<td>0.625</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doc_3</td>
<td>0.713</td>
<td>0.508</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doc_4</td>
<td>0.828</td>
<td>0.685</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doc_5</td>
<td>0.716</td>
<td>0.512</td>
<td></td>
</tr>
</tbody>
</table>
It is essential to establish the reliability and validity of the latent variables to complete the examination of the structural model. Indicator reliability value is the square each of the outer loadings where the score of 0.70 or higher is preferred. If it is exploratory research, 0.4 or higher is acceptable (10). Table 1 shows leadership (Org_1) and organization structure (Org_3) are not valid indicators for the organization as well as restorative (Sup_3) is not an accurate indicator of supervision. These three indicators were dropped in the next calculation process.

Traditionally, “Cronbach’s alpha” is used to measure reliability in social science research but it tends to provide a conservative measurement in PLS-SEM. Prior literature has suggested the use of “Average Variance Extraction (AVE) for convergent validity” as a replacement (11). From Table 1, such values are shown to be larger than 0.5 so high levels of convergent reliability have been demonstrated among all five reflective latent variables (11,12).

The score for the path coefficient and t statistic in the inner model are shown in Table 2.

The result indicates that the individual factors positively (capability and skill, psychological characteristics) affect the implementation of the clinical supervision with the path coefficient score of 0.353 and the t statistic is 3.389. The organizational factors (training & development, the structure of the organization) positively affect the implementation of the clinical supervision with the path coefficient score of 0.384 and the t statistic is 3.650. The work characteristic factors (design, feedback) positively affect the implementation of the clinical supervision with the path coefficient of 0.553 and the t statistic is 2.552. The PIR-C clinical supervision model (formative, normative, restorative) positively affects the nurses’ performance in improving the quality of nursing care documentation with the path coefficient score of 0.270, and the t statistic is 5.774. The positive sign on the coefficient shows the one-way relationship. This relationship means that the higher the organizational, personal and the work characteristic factors are, the bigger the results in increasing the clinical supervision are.

The result of statistical analysis on nurse performance in documenting nursing care by using Wilcoxon Signed Rank Test shows significance value $p = 0.00$ is smaller than standard value $\alpha = 0.05$ indicating that there is influence of application of clinical supervision model based on Proctor theory and interpersonal relationship cycle (PIR-C) on the performance of nurses in documenting nursing care in the wardroom of government hospitals in Surabaya Indonesia.

The quality of the structural model using R-square of the dependent variables is measured with the Stone–Geisser Q-square test for predictive relevance (13). The coefficient of clinical supervision and nurse performance is 0.609 and 0.306 respectively. Based on these figures, the Q-square predictive relevance is calculated as follows:

$$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2)$$

$$= 1 - (1 - 0.609)(1 - 0.306)$$

$$= 1 - (0.391)(0.694)$$

$$= 1 - 0.271 = 0.728 (72.8\%)$$

Since Q-squares is greater than zero, the model is stable, and the predictive relevance requirement is satisfied.

**DISCUSSIONS**

The results of this study support previous research in clinical supervision (3,14) that clinical supervision has the potential to improve staff skills that will ultimately
affect the successful attainment of the hospital. Clinical supervision is a tool to ensure or guarantee the completion of tasks following the goals and standards\(^\text{(15)}\). This study is also following the results of research which shows that clinical supervision can improve the performance of nurses\(^\text{(16)}\) and research found that the use of strategies in the application of clinical supervision can enhance the performance of nurses in the care documentation\(^\text{(17)}\). This indicates that consistent clinical control affects the working performance of nursing care under the standards of nursing practice.

The clinical supervision implementation is not only to monitor whether all nursing staff perform their duties as well as possible per the instructions or conditions outlined but also how to improve the ongoing nursing process. In the supervision activities, all nursing staff are not objects but also as a subject. Supervision in nursing is done to ensure the operations are carried out per the vision, mission, and objectives of the organization and following predetermined standards. This research is also in line stating one of the factors that affect the performance is supervision\(^\text{(18)}\) where supervision is the process of observing all organizational activities to ensure that all work underway is carried out under predetermined plans.

Supervision of nursing services will benefit the nurses in enhancing feelings of support, reducing professional isolation, decreasing work and emotional fatigue, increasing job satisfaction and morale, and developing professional practice and support in practice\(^\text{(19)}\). Further, supervision of nursing services can improve the relationship of nurses supervised by supervisors as well as in relationships with other nurses\(^\text{(20)}\). The use of documentation format in the application of clinical supervision model proctor supervision for normative, formative, and restorative dimensions is helpful to enhance process success and supervision sustainability\(^\text{(21)}\).

The results showed that the nurse’s performance in documenting nursing care before clinical supervision of the PIR-C model from supervisors who were trained and guided overall clinical supervision in the category of sufficient means was not optimal. According to the assumption that the researcher has not been optimally the performance of nurse, an executor is seen in the work result of nurse implementing that is illustrated from nursing care documentation which not yet according to set a standard. In the assessment aspect, the nurse has not undertaken all assessments by the prescribed assessment format and tends only to formulate an actual nursing diagnosis. In the issue of planning, the preparation of interventions tends to be routine and has not been referring to nursing problems experienced by patients, and has not yet described the involvement of patients and families. In the aspect of the implementation of nursing has not fully implemented independent actions according to the intervention already written but more to the act of devolution. The researchers also obtained part of the filling documentation of nursing care is not synchronized from assessment, diagnosis, intervention, implementation, and evaluation.

The implementation of clinical supervision model based on Proctor’s theory and interpersonal relationship cycle (PIR-C) in two public hospitals in Surabaya on the normative aspect through interpersonal relationship cycle stage (identification, orientation, exploitation, and resolution) has been established. The nurse conducts a complete and systematic review based on the assessment guidelines so that the diagnosis is in the form of an actual diagnosis, potential, and health promotion. The nurse’s ability to formulate nursing diagnoses enables nurses to pinpoint care goals appropriately and develop comprehensive intervention plans. Through this activity supervisors and nurses sit together to understand, improve, and build commitment to improving performance based on predetermined standards. Through this activity is expected to change the attitude and actions of nurses in implementing nursing care.

Supervisors need to collaborate with nurses in analyzing situations, so they can work together to be able to recognize, clarify, and identify existing problems. At the identification stage of supervisors and nurses to work together in solving problems. At the exploitation stage allows the nurse to feel a quality relationship with the supervisor and have a good perception to the supervisor that the supervisor can improve knowledge and solve problems faced by the nurse related nursing care documentation. The resolution stage explains that the nurse’s needs have been spotted and there is a collaborative effort between the supervisor and the executing nurse. This resolution enables the nurse’s ability to fill in complete and qualified nursing care documentation.

Interpersonal relationship cycle (orientation,
identification, exploitation, and resolution) orientation in
the formative aspect has spurred the implementing nurse
to provide knowledge and skills to the nurses related to
the filling of nursing care documentation, discussion
pertaining to the nurse’s experience in filling the
literature of nursing care (reflective practice) knowledge
and latest policy about nursing care documentation. The
application of the interpersonal relationship cycle (the
aspect of orientation, identification, exploitation, and
resolution) to the restorative element has spurred the
implementing nurse to provide motivation, empathy, and
help the nurse reduce burnout and conflicts while filling
in nursing care documentation.

CONCLUSION

The nurse performance on nursing care documentation
is vital to get serious attention and better management
of Surabaya public hospital considering some risks and
impacts that can arise related to documenting nursing
care, i.e., unavailability of a database associated with
the process of care nursing and complaints of nursing
actions that lead to the legal domain. Support from
hospital nursing management in providing support and
monitoring is critical to the continuity, sustainability,
and successful implementation of clinical supervision.
The intervention plan that the supervisor has set up
guides the supervisor in carrying out the implementation
of clinical supervision to the implementing nurses in the
hospital wards followed by evaluation and follow-up.
The clinical supervision activities based on the theory of
Proctor and the interpersonal relationship cycle (PIR-C)
conducted regularly, scheduled, and will spur the nurse’s
performance in documenting the nursing care so that the
result of complete and quality nursing documentation.

Ethical Clearance: The Ministry of Health Polytechnic Malang approved this research to be
conducted in Surabaya, Indonesia. A research permit
was requested from the local health authorities.

Conflict of Interest: Nil

Source of Funding: Ministry of Health, Republic
of Indonesia.

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ABSTRACT

Cancer of children affect to the parent self-acceptance toward children conditions. The purpose of this study was to investigate the effect of psychoreligy intervention to strengthen self-acceptance on mother of children suffering cancer. The design of this study was pre-experimental study. The sample size were 25 mothers who met inclusion criteria taken by purposive sampling. The inclusion criteria were mothers who have children suffering cancer less than six months and moslem. The independent variable was psychoreligy intervention (pray and dhikr), while the dependent variable was parent self-acceptance. Data were taken by using questionnaire then analyzed by using Wilcoxon Sign Rank Test with \( \alpha = 0.05 \). The result showed that most of mothers stayed on denial and bargaining phases. While after the psychoreligy intervention all the mothers change on acceptance phase with statistical test \( p < 0.001 \). It can be concluded that psychoreligy intervention strengthens mothers self-acceptance related with children condition. This study suggested to give psychoreligy therapy as an alternative nursing intervention for mother with acceptance problems when caring her children. Further research can develop psychoreligy in general religion not only for Moslem.

Keywords: psychoreligy, self-acceptance, mother, pediatric cancer

INTRODUCTION

According to WHO data in 2012 the number of cancer patients in all age groups reached 14,067,894 sufferers\(^1\). Cancer in children has increased every year. About 110 to 130 cases per million children per year. 80% of childhood cancer cases occur in developing countries. Indonesia as a developing country has a child cancer incidence rate of 11,000 per year child cancer found\(^2\). The highest childhood cancer is ALL (acute lymphoblastic leukemia).\(^3\) There was an increase in 2009 to 2010. Four cases of cancer in other children were Neuroblastoma, LNH (Non Hodgkin’s Lymphoma), Retinoblastoma and Wilms Tumor\(^3\).

Parents who have children with cancer will face various problems related to psychological problems such as hopeless and depression. The degree of hopeless between mother and father is higher experienced by mothers\(^4\). Parents, especially mothers, were found to be 36.4% having experienced the phase of self-depression major depression and 18.2% moderate depression. The process of self-acceptance in the form of depression and anxiety in mothers with children with cancer is higher than other chronic diseases\(^4\). Based on research shows that most parents have a negative self-acceptance response in accepting the condition of childhood cancer\(^5\). The phenomenon that occurred in the Pediatric Oncology ward Soetomo General Hospital Surabaya found that mothers who had children with cancer diagnosis experienced psychological disorders in the form of shock, not accepting the reality, mistrust, sadness, anxiety, anger, depression and feeling hopeless. The similar study showed that 20% of mothers who have diagnosed children with cancer experience stress in the moderate category\(^6\). Based on the theory of mourning Kubbler Ross explained that physiologically humans undergo 5 stages of grieving begins with rejection (denial), anger (anger), bargaining (bargaining), depression (depression), and accept (acceptance)\(^7\). Someone who drags on in a condition of grieving and not quickly towards the stage of accepting (acceptance) so that disrupt the task and its main role function is said
to be in the condition of pathological grieving\(^7\).

Patients and family face intense stress caused by cancer’s diagnosis and its treatment\(^8\). Parents who show depressiveness signs more often use denial, behavioral disengagement, self-blame strategies and less self-distraction, active coping, positive reframing, humor, acceptance than parents without depressiveness signs\(^9\). The process of self-acceptance for religious individuals is closely related to divine values. Understanding each incident as the destiny of God Almighty fosters a sense of sincerity while at the same time creating a new source of religious power\(^10\). Psychiatric therapy may be an alternative solution to overcome psychological problems. Psychoreligi therapy is a form of psychotherapy that combines modern mental health approaches and approaches to religious aspects aimed at improving coping mechanisms\(^11\). Dhikr means remembering or awareness of the presence of God everywhere and at any time, as well as awareness of his being together with beings\(^12\). Someone who is religious or obedient to his religious teachings is relatively healthier and able to overcome problems\(^13\). on the description, the researchers are interested in examining the application of psychiatric therapy in prayer and dhikr to increase self-acceptance in mothers who have children with cancer.

**MATERIALS AND METHOD**

The design of this study uses a pre-experimental study. Dependent variables were measured twice before intervention and after intervention. The population of this study were all mothers who had cancer-treated children in the pediatric oncology ward. A sample size of 30 respondents who met the criteria for inclusion included mothers who had cancer children less than 6 months, and mothers who were Muslims.

The independent variable in this study was psychoreligi which contains guidance on pray and dhikr. While the dependent variable in this study was the phase of mother self-acceptance. The instrument in the study used a modified questionnaire from the concept of Kubler Ross\(^8\) and developed by Kurnia\(^9\). The instrument is filled by the mother without coercion from the researcher.

This research instrument has been tested for validity obtained 25 valid items with a reliability value r = 0.968 (r > r table, r table = 0.396). Pray and dhikr psychoreligy instruments was module containing guidance and therapy reading. This research protocol has received ethical approval from the health research ethics commission of Soetomo General Hospital with certificate number 83 / Panke. KKE / II / 2017 was declared ethically feasible.

The study began with the administration of a pre-test, then the pretest data were analyzed. The data showed that there were no respondents who had a self-acceptance phase, so that they met the inclusion for psychoreligy intervention. Then the researcher explained that psychoreligy intervention was done one day five times after the five daily prays with a duration of 10-15 minutes, the duration of the intervention was done within 7 days (a week) starting from the date the researcher distributed the booklet, the intervention was monitored and guided directly by the researcher every day after the respondent fulfills the afternoon pray. The monitoring and mentoring process was carried out in groups of around 3-5 people each groups. All respondents who participated in the study were cooperative with the intervention provided, so that no respondents experienced a dropout.

The final stage of data collection was a self-acceptance questionnaire fulfillment for the second time after the intervention was complete. The second data collection was carried out after the respondent had done the psychoreligy intervention of pray and dhikr for the last time. The second data was used as posttest data. Pre and post test results were analyzed using Wilcoxon signed rank test with a significance level of α = 0.05.

**FINDING**

The results showed that the majority of the study respondents were at the age of 26-35 years as many as 15 respondents with a percentage of 60%. Distribution of education levels found that the majority of research respondents were at the high school level as many as 12 respondents with a percentage of 48%. Distribution based on work found the majority of research respondents worked as housewives and private employees, each of 12 respondents with a percentage of 48%. The income distribution of the majority of respondents is in the income <Rp.500,000 as many as 12 respondents with a percentage of 48%. Financing distribution was obtained by all respondents using BPJS services as many as 25 respondents with a percentage of 100%. The distribution of treatment time is found to be majority within 1-2 months with a total of 16 respondents with a percentage
The results of the pre-test obtained were 12 respondents (48%) in the denial stage and 9 respondents (36%) were in the bargaining stage. While the post-test results obtained by all respondents (100%) are in the acceptance stage. The results of statistical tests using Wilcoxon signed rank test showed that the value of \( p = 0.000 \) means that the value of \( p < 0.05 \), this result indicates that there is an influence between psychoreligy intervention on the level of self-acceptance of mothers who have children with cancer (table 2).

### Table 1: Demographic characteristics of respondents mothers who have cancer children

<table>
<thead>
<tr>
<th>No</th>
<th>Demographic</th>
<th>Indicators</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Umur (years old)</td>
<td>17-25</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26-35</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36-45</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>46-55</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>Education</td>
<td>Junior high school</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior high school</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diploma</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3.</td>
<td>Occupation</td>
<td>Housewives</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farmer</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employee</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>4.</td>
<td>Income (IDR)</td>
<td>&lt;500.000</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500.000 – 1,500.000</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,500.000 – Rp. 2,000.000</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>5.</td>
<td>Funding</td>
<td>Government insurance</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self-funding</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td>Leng of stay (months)</td>
<td>&lt; 1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 - 2</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 2 – 3</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 3</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

### Table 2: Level of self-acceptance of mothers who have children with cancer before and after psychoreligy intervention

<table>
<thead>
<tr>
<th>Self-acceptance phases</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Denial</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Anger</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Bargaining</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>Depression</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Acceptance</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

The results showed that almost half of the respondents had a level of self-acceptance in the denial phase before psychoreligy intervention. According to Kubler-Ross said that first reaction of individuals who experience loss is shock, disbelief, or denying the fact that loss actually occurs⁷. This relates to the characteristics of education and income of respondents. Education is a formal means of getting information, forming rational thinking patterns and emotional maturation. Most respondents have education in high school level, these conditions make respondents still have a level of education in sufficient categories so that the process of receiving a diagnosis of cancer in their children has a tendency to rejection or denial. Revenue as an indicator of respondents’ level of adequacy in material aspects, especially finance. Most respondents have a low income category of less than five hundred thousand rupiahs. Low income causes limitations on the financial access of respondents, even though all respondents are guaranteed medical expenses with government insurance, namely BPJS, but for daily needs and non-medical care costs, they still need a source of personal or self-financing costs.

Self-acceptance phase experienced by respondents other than denial also has a phase of bargaining. The stages of bargaining are shown in the form of presuppositions if only a re-examination is done on the child, it might get better results and if I try to give the best to my child, maybe my child will get well soon. According to Kubler-Ross said that in the bargaining phase there is a delay in awareness of the reality of the loss and can try to make the agreement smoothly or openly as if the loss can be prevented. Individuals may try to bargain by asking God for mercy⁷.
After psychoreligy intervention, all respondents have a stage of self-acceptance in the acceptance phase. According to the theory proposed by Kubler-Ross said that in the acceptance phase related to the reorganization of the feeling of loss, the mind which is always centered on the missing object begins to diminish or disappear. Individuals have accepted the reality of the loss they experienced and began to look forward. Changes in the stage of mothers who have children with cancer become acceptance is the influence of psychiatric therapy of prayer and dhikr. Pray and dhikr therapy provides tranquility while restoring individual consciousness to the power of the Essence of Allah SWT. This gives rise to strength and sincerity for the mother in facing the reality that happened to her child.

Study in Iran showed that that participation in spiritual therapy program is associated with improvements in spiritual well-being and Quality of Life (QOL) on women with Breast Cancer. The goals of psychology include cleansing the heart of diseases, both illnesses related to God, with oneself (freeing oneself from being, with other humans and the universe), mastering the influence of primitive impulses. Psychological therapy of prayer and dhikr is closely related to aspects of spirituality. The spiritual aspect is an important part of the human component besides biological, psychological, and social. Nurse as a care giver and also researcher have to more to implement inter professional research and practice efforts related to spirituality and spiritual care.

CONCLUSION

Psychoreligy interventions can strengthen the mother’s self-acceptance response in the face of children suffering from cancer. Psychoreligy interventions can provide peace in the mind of parents, so they are more resigned and accept the provisions given by God. Tranquility in parents can be a strength to treat cancerous children without feeling heavy. It is recommended for nurses to be able to apply psychoreligy interventions in caring for children and parents in the child’s oncology room to overcome rejection or psychological problems related to the stages of self-acceptance of mothers who have cancer children.

Conflict of Interest: There is no potential conflict of interest over the publication of this article.

Funding: This study and publication was self-funding by Authors.

Ethical Clearance: This study did not use animals and does not mention the identity or medical record of the respondents. This research protocol has received ethical approval from health research ethics commission.

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Ex-Leprosy Patients Empowerment for Improving Living Quality through Empirical Rational Strategy in Makassar 2018

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ABSTRACT

Leprosy is still a public health problem in Indonesia. The impact is complex including medical, social, economic, cultural and security aspects. This study aimed to determine the formulation of a rational empirical strategy consisting of attitudes, life skills, work, economics, motivation and self-confidence, the implementation of empirical strategies and evaluation of rational empirical strategies for ex-leprosy in Makassar. This research used qualitative approach. Research side was on Jalan Dangko Makassar which is a leprosy village. Key informants included the Chairperson of the RW (sub-village) while the usual informants were lepers.

This research showed by looking at the formulation of rational empirical strategies including attitudes of life skills, work skills, economics, motivation and self-confidence of former lepers. In the implementation phase of a rational empirical strategy, researchers teach them to make various kinds of handicrafts and in the evaluation stage of rational empirical strategies, researchers try to market these items either directly or through social media applications. Cross-sector studies are needed to provide a more comprehensive approach to strengthen their empowerment.

Keywords: Empowerment, quality of life, strategy, rational empirical strategy.

INTRODUCTION

Leprosy is a public health problem in Indonesia and the impact is very complex both from the medical, social, economic, cultural and security aspects. Leprosy is generally in developing countries, and most sufferers are from the weak economy. This is as a result of the country’s limitations in providing adequate services in the fields of health, education, socio-economic welfare of the community 1.

WHO 2 emphasised that Leprosy is curable with multidrug therapy (MDT). It is transmitted through droplets, from the nose and mouth, during close and frequent contacts with untreated cases. The number of cases is quite high and according to WHO that untreated, leprosy can cause progressive and permanent damage to the skin, nerves, limbs, and eyes. WHO, furthermore, reported that in 2016 there were 216,108 new leprosy cases registered globally spread in 145 countries from the 6 WHO Regions. Indonesia is ranked as the third most leprosy endemic country after India and Brazil 3.

Number of new cases of leprosy and Case Detection Rate (CDR) per 100,000 population respectively were 10,477 and 4.0. South Sulawesi Province had new cases 870 and Case Detection Rate 10,01, even South Sulawesi is recorded with provinces that have the third highest leprosy case after East Java and West Java 4.

Based on the results of the recording and reporting of the P2PL of Makassar City Health Office, the number of new cases of PB (dry leprosy) in 2015 was 35 cases, while 139 cases of new cases of MB (wet leprosy) were

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139 cases. The total leprosy cases are 174 cases. The prevalence of leprosy in Makassar City for the past 3 (three) years has decreased 5.

To reduce leprosy cases, WHO launched the Global Leprosy Strategy 2016–2020. This strategies aim to reinvigorate efforts to control leprosy and avert disabilities, especially among children still affected by the disease in endemic countries. The strategy emphasizes the need to sustain expertise and increase the number of skilled leprosy staff, improve the participation of affected persons in leprosy services and reduce visible deformities as well as stigmatization associated with the disease. The primary interventions to achieve the targets include: 1). detecting cases early before visible disabilities occur, with a special focus on children as a way to reduce disabilities and reduce transmission; 2). targeting detection among higher risk groups through campaigns in highly endemic areas or communities; 3). improving health care coverage and access for marginalized populations; 4). Endemic countries need to include other strategic interventions in their national plans to meet the new targets 6.

Researchers point out that leprosy stigma has a broad influence on clients’ lives from marriage, work, interpersonal relationships and relationships with the environment 7. Leprosy sufferers are ostracized by their families and communities and generally they are left by their partners for those who have a family 8. Husbands who suffer from leprosy are not included in the decision making and activities in the family and the interaction with other family members is limited 9. Disability in leprosy clients makes it an obstacle in accepting leprosy clients. Mental health problems in leprosy clients have been shown to show a higher prevalence of psychiatric problems. Leprosy clients experience anxiety, loss of self-esteem and poor self-acceptance 10.

The purpose of a rational empirical strategy is the change of knowledge through information or the basis of intellectual thought. The strategy formulation by the Nalacity Community surveying the activities of former lepers and the skills they have to focus on producing feasible alternative strategies by supporting external and internal factors. The Nalacity community began using a variety of techniques obtained, namely former lepers with methods of sewing skills and the implementation of the Nalacity community strategy utilizing information systems and media as a promotional and marketing tool to distribute the work of former lepers. In the evaluation phase, the Nalacity community strategy saw that with the sewing skills, the former lepers could channel their talents and also earn their income.

This study deals with the empowerment of ex-leprosy patients to improve the quality of their lives through rational empirical strategy. The results of this study are expected to help in improving the economy of the former lepers. Skills and independence are very important for former lepers who do not have decent work.

**MATERIALS AND METHOD**

This type of research is qualitative 11,12. This research aimed to get in-depth information about empowerment of leprosy patients to improve the quality of life through a rational empirical strategy using independent interviews. This research was conducted at Jalan Dangko Makassar in 2018 which is an area that inhabits many lepers or former lepers. This research was conducted in March-April 2018. The key informants in this study were the RW leaders. Regular informant is in this study were former lepers.

Research data sources were primary data and secondary data. The instruments used in this study were cameras, voice recording devices and field notes. Data collection method was In-depth Interview. In-depth interviews were conducted with informants who were considered able to provide accurate data in accordance with the questions regarding the variables studied. The second method of data collection was observation. This method was done by observing the informants’ daily life. This method aims to help the data obtained through in-depth interview techniques. Furthermore, the third data collection technique was documentation. Documentation included interviews with informants. Data analysis was by grouping or collecting interview results in accordance with the objectives of the study, categorizing, analyzing, then interpreting and presented in a narrative manner.

**RESULTS AND DISCUSSION**

Variables in this study are the strategy formulation consisting of attitudes, life skills, work skills, economics, motivation and confidence; strategy implementation, and strategy evaluation.
1. **Strategy Formulation**

   a. **Attitudes**

      Based on interviews with informants, the attitude of former lepers when they found out that leprosy was diverse.

      “Like being desperate, so I said to die or kill myself because there is no point in living”. (HMR, 43 years)

      “In the past, I didn’t have hope, I’d better end my life, if I hadn’t sinned to commit suicide maybe we would have killed ourselves, but we were still given the power by God not to commit suicide” (AQR, 46 years).

      “Many of them feel isolated in their homes due to their illness”. (MSK, 50 Years).

      Based on interviews with informants regarding family attitudes to them when they had leprosy as follows:

      I left because I was shunned by my family, there was no family who wanted to help, there was a sense of revenge with my family” (HSN, 45 years).

      Family attitudes toward them vary, in general are quite good. They were helped and encouraged by the family to go for treatment, but some of them did not care.

      Furthermore, attitudes of the community to the ex-lepers, can be seen from the interview as follows:

      “I experience discrimination, parents also experience discrimination with their neighbors, we also experience discrimination with family, because this disease is disgraceful, stigmatized, that leprosy is caused by illicit relationships such as menstruation and sexual relations (AQR, 46 years).

      The attitude of society varies. Some people’s attitudes stay away from them because they are afraid of being infected and some are disgusted, but some accept their condition.

   b. **Life skill**

      Life skills of former lepers are based on interviews from various research informants, both RW heads and people who have had leprosy.

      “Yes, I received stitches, but now I’m not strong anymore because of uric acid” (HRM, 68 years).

      “I can make a hijab brooch” (SRN, 39 Years).

      Lepers have the skills to develop. They can make doormats, hijab brooches, dress sewing, bags of used goods. There are also people who are good at gardening.

   c. **Occupation**

      The work of lepers is not too much, even most of them do not have a job. Maybe because it is related to their physical and health conditions. They are parking attendants, and beggars. Others are as tailors and as independent consultants about leprosy.

      “My work is now as a beggar, I have no one foot” (IGS, 55 years).

      “I am a parking attendant on Jalan Sulawesi” (MSM, 30 Years).

   d. **Income**

      The income of lepers is not fixed, but some say that their income is around Rp. 500,000 per month.

      “I usually get 500,000 per month, that’s not enough for everyday needs, too many children” (RHM, 46 Years).

   e. **Motivation**

      The sufferers still have the motivation to recover, especially when they are actively involved in the organization. That is why they are diligent in treatment.

      “Surely they have motivation, such as motivation to recover because I see them active to go for treatment” (MSK, 50 Years).

      The form of family motivation is in the form of accompanying them to go for treatment to health care facilities, even the family also suggests doing traditional medicine. There is also a motivation to come from the patient himself to do medication.

      “My family used to accompany me to go for treatment” (HMR, 43 years).

      “My parents used to say don’t stop mabbura ugi (IDS, 72 years).

      There are also people who provide support and motivation to the patient to do treatment, but there is also no care for them.
f. Confidence

The confidence of former lepers is important. Initially, it was difficult because it was not accepted by family and society. But now it is slowly being accepted by the community especially since they have started to get involved in the organization.

“Before in the organization, self-confidence was very backward, collapsed, but after we were taught to organize, self-confidence arose again, we considered ourselves as with other people” (MTR, 51 Years).

“There is a sufferer worse than me, that makes my confidence to live” (AQR, 46 years).

“We sometimes still feel shy with this disease” (SRN, 39 Years).

The conclusion is that self-confidence for lepers has begun to emerge, moreover they have begun to be involved in the organization or socialization about the importance of health, building their motivation for life and continuing treatment. Even so, not a few are still feeling ashamed, especially those who have been disabled because they are late in treatment.

2. Implementation of Rational Empirical Strategies

In the formulation of the strategy, researchers implemented the empowerment of people who have had leprosy by forming handicraft groups. Some types of handicrafts are, for example, hijab brooches and key chains to improve their living and economic improvement. Figure 1.1 illustrates their craft making.

Figure 1.1: Documentation of their craft making

The tools used include scissors, gun glue and needle threads, while materials such as tile, flannel, ribbons, beads, hangers and pins.

3. Evaluation of Rational Empirical Strategies

This study shows that former lepers still face many things. They have problems relating to attitudes, life skills, work skills, income, motivation and confidence.

They live in a village in Makassar City which is dominated by lepers or former lepers. The purpose of allocating them is to make it easier to control, monitor and handle their various problems and needs. Patients or former sufferers of this center have very high psychosocial problems because they are not accepted by their families and even the community. They are ostracized by the surrounding environment. They are also not confident in their health conditions. This condition strengthens for them to be limited in interacting with their community environment. Because they are limited in interacting with other people, they also have limited access to finding sources of life to meet their daily needs.

Community empowerment for them is needed 13,14. The purpose of this empowerment is that lepers or former lepers must be able to help themselves. They themselves can help themselves in the long run. Former lepers cannot depend on the government because in this way the government does not provide educational value. Government responsibility is certainly important but for lepers, they must also rise up to fight themselves and their environment.

Their needs are very complex 15. Their needs are health services, decent living needs, housing needs, security needs, needs to be appreciated and accepted by family and society 8,16.

Another approach for lepers or former lepers to solve health problems, their social environment and physical environment is needed. The setting approach (healthy city or healthy alley or healthy village) as an approach that has been successfully tested in several developed countries needs to be done to see the changes that occur 17,18. This approach suggests that lepers are not just a medical problem, but this involves food, safety, environment and housing problems that require a more comprehensive approach. Settlement area arrangements, public facilities and infrastructure, healthy and independent social life, food and nutrition security, must also apply to them as important indicators 19-21.

Health services for lepers also need to be strengthened, especially in this era of national health insurance 22.

CONCLUSION AND RECOMMENDATION
Based on the results of this study, it can be concluded that by looking at the formulation of rational empirical strategies including attitudes of life skills, work skills, economics, motivation and self-confidence of former lepers, we can formulate strategies for example by making handicraft groups. In the implementation phase of a rational empirical strategy, researchers teach them to make various kinds of handicrafts and in the evaluation stage of rational empirical strategies, researchers try to market these items either directly or through social media applications. Cross-sector studies of leprosy sufferers are needed to provide a more comprehensive approach both from the health, social, religious, environmental and economic aspects.

Conflicts of Interest: Nil

Ethical Clearance: Taken from the Muslim University of Indonesia, Makassar Indonesia.

Source of Funding: Nil

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Safety Risk Factors amongst Online Motorcycle Taxi Drivers Who Provide Public Transportation in Depok, Indonesia

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ABSTRACT

In Indonesia, motorcycles are typically the first choice and favourite form of transportation, particularly since they were integrated with the country’s online transportation-for-hire system. This system, known as ‘online ojek’, was organised by a number of companies. This employment type, which involves drivers who work as independent contractors rather than employees, is characterised by weak engagement of the company with the drivers, making it difficult to ensure drivers’ health and safety. As a result, it is important to understand the safety risk factors affecting online ojek drivers. This research was qualitative and quantitative in nature and took place in the cities of Depok, Bekasi, Bogor, and Tangerang. A total of 101 participants were selected by purposive random sampling. The research found that 48.04% of participants had experienced a ‘near miss’ whilst driving, caused by a lack of concentration, and 67.65% of respondents blamed their lack of mental focus on fatigue. Furthermore, we discovered that 41.18% of participants sleep fewer than six hours per day, and 47.06% work 11–15 hours per day. Additional factors that affect fatigue are motorcycle vibration and road noise. Moreover, all respondents showed signs of musculoskeletal disorders, with 25% indicating they felt pain in the low back and 17% in their thighs.

Keywords: fatigue, safety, online motorcycle drivers, sleep, work duration

INTRODUCTION

The National Statistic Center (2016) reported that the number of motorcycles owned in Indonesia has experienced a rapid increase within the past ten years, with the current number of motorcycles being 76.6 million¹. At the same time, the Indonesian Motorcycle Industry Association reported that, in 2017, the Western Java Province had the highest motorcycle purchase rate in Indonesia, with 674,642 motorcycles being sold that year.

Reasons for this high rate of motorcycle usage are varied and include the availability of easy credit, economical usage costs, the need to travel only short distances, and lifestyle demands. One of the effects of the high number of motorcycles is the blooming of the online-based motorcycle taxi service known as ‘online ojek’. This service is considered capable of solving the problem of traffic jams, especially in large cities. As a result of these factors, many people in the community are attracted to becoming online ojek service providers.

Because online ojek companies require no fixed work schedule, but, rather, operate by a minimum target system for drivers, many drivers work to excess after meeting their targets in an effort to earn higher wages. Some drivers work until dusk to meet the daily target and receive a bonus. However, motorcycles are not considered suitable for long periods of travel. This behaviour can increase occupational safety risks, which include driver fatigue and road accidents. According to data published by the Indonesian National Traffic Police, motorcycle accidents represent the highest number of recorded road accidents. According to their official
website, 31,789 motorcycle accidents were recorded in 2017. Considering the significant safety risks faced by online ojek drivers, it is important to understand the associated risk factors that can contribute to motorcycle accidents and threaten the safety of ojek drivers.

**METHOD**

This research was a descriptive study based on qualitative and quantitative data collected by questionnaire and deep interview. The research location was the city of Depok in Western Java, Indonesia. The number of respondents was 101, and they were selected through purposive random sampling. The questionnaires underwent both validation and reliability tests.

We aimed to gather in-depth, qualitative data regarding drivers’ health complaints in terms of musculoskeletal symptoms (MSS). To that end, a musculoskeletal disorders (MSDs) questionnaire by Nordic Musculoskeletal Symptoms (2) was used in this research. Our collection of quantitative data focused on other aspects that affect safe driving, such as driver rest duration, total distance travelled per day, work hours per day, total number of trips per day, driver age, hand phone placement, and age of the motorcycle.

**RESULTS**

The drivers’ characteristics, as seen in Table 1 below, show that participants aged 26 to 35 years comprised the largest age group in this study (45 drivers, 44.55%). A total of 66 drivers (65.35%) worked between five and ten times per day. The most frequently cited work duration was 11 to 15 hours, which 46.53% of participants indicated as their total number of hours worked per day. The most common distance travelled per day was between 51 and 100 km, which was indicated by 45.10% of participants. The most commonly cited sleep duration (54.90%) was six to eight hours per day. A majority (51.96%) of participants had not experienced a ‘near miss’ event, whilst 43.56% of participants reported that they have their motorcycle serviced 11 or more times per year.

**Table 1. Drivers’ characteristics.**

<table>
<thead>
<tr>
<th>Characteristics of Drivers</th>
<th>Mean (SD)</th>
<th>n %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16–25 years old</td>
<td>33.227 (8.693)</td>
<td>19.80%</td>
</tr>
<tr>
<td>26–35 years old</td>
<td>45</td>
<td>44.55%</td>
</tr>
<tr>
<td>36–45 years old</td>
<td>25</td>
<td>24.75%</td>
</tr>
<tr>
<td>46–55 years old</td>
<td>11</td>
<td>10.89%</td>
</tr>
<tr>
<td>Work frequency per day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–10 times</td>
<td>10.386 (4.004)</td>
<td>65.35%</td>
</tr>
<tr>
<td>11–15 times</td>
<td>25</td>
<td>24.75%</td>
</tr>
<tr>
<td>16–20 times</td>
<td>10</td>
<td>9.90%</td>
</tr>
<tr>
<td>21–25 times</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Work duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–5 hours</td>
<td>10.841 (3.659)</td>
<td>4.95%</td>
</tr>
<tr>
<td>6–10 hours</td>
<td>40</td>
<td>39.60%</td>
</tr>
<tr>
<td>11–15 hours</td>
<td>47</td>
<td>46.53%</td>
</tr>
<tr>
<td>16–20 hours</td>
<td>9</td>
<td>8.91%</td>
</tr>
<tr>
<td>Total distance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–50 km</td>
<td>78.237 (50.014)</td>
<td>35.29%</td>
</tr>
<tr>
<td>51–100 km</td>
<td>46</td>
<td>45.10%</td>
</tr>
<tr>
<td>&gt; 150 km</td>
<td>12</td>
<td>11.76%</td>
</tr>
<tr>
<td>Unidentified</td>
<td>7</td>
<td>6.86%</td>
</tr>
<tr>
<td>Sleep duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6 hours</td>
<td>5.940 (1.502)</td>
<td>41.18%</td>
</tr>
<tr>
<td>6–8 hours</td>
<td>56</td>
<td>54.90%</td>
</tr>
<tr>
<td>&gt; 8 hours</td>
<td>3</td>
<td>2.94%</td>
</tr>
<tr>
<td>Unidentified</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Figure 3, which illustrates the influence of mobile phone use whilst driving, shows that 54.90% of all study participants said they use a mobile phone whilst driving, yet, 63.73% said that they did not lose focus whilst driving.

Table 1. Drivers’ characteristics.

<table>
<thead>
<tr>
<th>‘Near miss’ event</th>
<th>--</th>
<th>48</th>
<th>47.06%</th>
<th>53</th>
<th>51.96%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycle maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–5 times/year</td>
<td>8.811</td>
<td>36</td>
<td>35.64%</td>
<td>6.309</td>
<td>21</td>
</tr>
<tr>
<td>6–10 times/year</td>
<td></td>
<td>44</td>
<td>43.56%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 11 times/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Factors that affect focus whilst driving.

As shown in Figure 1, the factor most likely to affect focus whilst driving was fatigue, which was cited by 67.33% of study participants.

Figure 2. The influence of helmets on driving.

Figure 2 illustrates that 100% of all study participants used a standardised helmet. A large majority (81.37%) indicated that using a helmet was not visually distracting, and 63.73% said that wearing a helmet was not a cause of fatigue.

Figure 3. The influence of mobile phones on driving.

All the respondents felt sign of musculoskeletal disorders. Mostly they felt comforted on their lower back (25%) and thigh (17%).

DISCUSSION

Work duration, or period of travel for ojek online drivers, becomes one of the environment/trip factors that could cause fatigue on ojek online drivers. From the result of this research, fatigue is a main reason of concentration loss when driving(3). Other research also shows that work duration becomes a direct causation factor of injury causation on drivers(4). This result is supported with some past research on different countries that shows there are correlations between period of travel, driving time from dusk until late night, with injury causation on drivers (5–7)
Based on European Commission’s regulation, driving is not allowed to surpass nine hours every day or 56 hours every week. Resting time on each day must not be disturbed with a minimum of 11 hours out of 24 hours of each day. Resting from 45 minutes is needed after driving for more than 4 ½ hours.(8) On Finnish Working Hours Act, a motorcycle driver must take rest for a minimum of 30 minutes on each 5 ½ hours of working period in which working period means all work activities whether it’s driving or other tasks(9).

People in high-income countries may use motorcycles as a sport or leisure activity, compared with low-income countries which may use them as a cheap method for transportation. The energy transmitted in crashes will be definitely different in those two conditions with more mortality in those having high speed and energy(10). In UAE, more local UAE national motorcycle riders use high speed motorcycles for leisure sports. They sustain more serious abdominal injuries compared with expatriates who use cheaper motorcycles for transportation as they sustain more lower limb injuries(11).

In this research, all ojek online drivers have use standardized helmet. The helmets that are used by the driver and its passenger are given from the company. Wearers of non-approved helmets suffer head injuries more than twice as frequently and twice as severe as wearers of approved helmets (12). There are few tests quantifying their actual impact performance(13,14). Additional data for non-approved helmets are thus needed to better demonstrate the benefit of approved helmets for both safety education and forensic purposes.

The usage of helmets for motorcycle drivers is important due to reducing head injury damages when accidents happen. Head injury is a common cause of severe morbidity and mortality in motorcycle crashes(15,16) and it is more common in motorcyclists than car occupants(16). Many studies have shown that motorcycle helmets reduce head injury and motorcycle-related deaths. In the early nineties, the usage of helmet was low and debate regarding its effectiveness was common. Many studies at that time showed that helmets reduce severity of head and spinal injuries, hospital stay, cost, and mortality of motorcycle crashes(17–19). Motorcyclists that does not use helmets are 40% more likely to suffer from a fatal head injury(20) Glasgow coma scale, which is an indicator of severity of head injury, was significantly lower in those not wearing motorcycle helmets, compared with those who did(21).

Some riders are hesitant to wear helmets thinking that helmets are not comfortable and their use adversely affects safety(22,23). This research also discovers that around 18% of respondents feel that helmet distracts their vision when driving and 35% admits of fatigue due to the long period of helmet usage. A study from China has shown that about 70% of motorcycle drivers thought that helmets were not comfortable; almost 40% thought that helmets block their vision, and 75% used helmets just to avoid police penalties(7) McKnight et al. studied in detail the effect of helmet use on vision and hearing. They concluded that riders accommodate the effect of helmets by rotating their heads to increase the visual field to be similar to non-helmeted riders. The hearing threshold was also not significantly affected by wearing a helmet(24).

Motorcyclists phone usage while driving is a safety concern, especially if this distracting behavior would increase their risk of crash, as reported among car drivers (25,26). This research on ojek online drivers discovers that 55% use their mobile phone during driving due to navigate their way through map application on their mobile phone. 35% of respondents also admit that driving while looking on their mobile phone could cause focus loss. However, little is known about the prevalence and impacts of mobile phone use while riding a motorcycle. It is worth noting that motorcyclists are vulnerable road users in many countries, particularly in developing countries. For example, motorcycles represent 52% of vehicles in Nigeria, 53% in Tanzania, 59% in Thailand, 78% in Laos, 83% in Indonesia, and 95% in Vietnam (27,28). In addition, motorcyclist fatalities account for 34% of all traffic fatalities in Southeast Asia (27). Surprisingly, very few studies have investigated the prevalence of mobile phone use among motorcyclists and associated factors. Phommachanh et al. (2016) found that 40% of high school students admitted to using mobile phone while riding in Vientiane, Laos (29), Contrary other study done by National Safety Council shows that 21% of crashes or 1.1 million crashes in 2010 involve talking on handheld and hands-free mobile phones, and an additional 3% or more crashes or a minimum of 160,000 of crashes in 2010 involve text messaging(30).
CONCLUSION

Ojek online becomes a favorite mode of transportation through its inexpensive cost and short travel time, causing more people to join as an ojek online driver. From the results of this research, 46.53% of ojek online drivers’ work period is around 11-15 hours per day. 47% of drivers have experienced near miss and the majority of cause is due to fatigue (67.33%). All ojek online drivers have used standardized helmet even though 35.29% admit fatigue occurrence due to the long period of helmet usage and 17.65% admit that the helmet distract their vision. 54.9% of ojek online drivers use mobile phone during driving although their concentration is disturbed by that specific behavior. The majority of MSDs complaints are at the lower back (25%) and thigh (17%).

Conflict of Interest: NIL

Ethical Clearance: The study was approved by the Ethical Committee of Faculty of Public Health, Universitas Indonesia, Indonesia, the approval number is 366/UN2.F10/PPM.00.02/2018

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Analysis of the Content of the Book of Physics for the Fourth Grade Preparatory According to the Criteria (CFBT)

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1Department of Graduate Studies - Methods of Teaching General Sciences, Faculty of Basic Education, University of Babylon, Iraq

ABSTRACT

The study aimed at analyzing the physics book for the fourth grade according to the criteria of (CFBT). The research problem was determined by the following question: What is the availability of CFBT standards in the physics book for the fourth grade? The researcher prepared a list of criteria (CFBT) in English and presented them to specialists in English to translate into Arabic, then prepared a list of standards translated after the agreement to be translated by English language specialists, and presented to educational professionals in ways of teaching general science to verify the adequacy of standards for the content of books. And after obtaining the agreement of educational specialists in the field of science on the compatibility of standards for the book of physics, the researcher began to analyze the content of the book of physics for the fourth grade according to the standard (CFBT) using the descriptive analytical method.

Keywords: Content Analysis - Physics Books - Criteria (CFBT) - Fourth Preparatory

INTRODUCTION

The textbook is one of the main elements of the educational system. And an important means to achieve its objectives, including the provision of scientific material and various educational experiences depend on the teacher and the learner within and outside the classroom and reflects the vision of the national educational curricula and educational perspectives. And in order to address these problems and shortcomings, and the desire to keep pace with the development in the field of natural sciences and developments in the design of educational materials and strategies of teaching and evaluation in line with international standards and theories of modern education, including the criteria (CFBT) used by the researcher in the study of research, which is a center for British teachers specialized in Education Center For British Teacher) and educational areas outside the British Department of Education and Science is a pioneer in providing educational services for the public good in the UK and around the world. Content analysis consists of two terms, one is analysis, the other is content. The analysis defines fragmentation or the breakdown of all into parts or vocabulary and its main elements. Content refers to the communication material addressed by the researcher for analysis. The process of content analysis is inherent to human thought, and is aimed at clearly recognizing things and phenomena by isolating elements of each other, identifying the characteristics or characteristics of these elements, and the nature of the relationships between them. The Book of Physics: The systematic book to be taught by the Ministry of Education in a class of classes according to the curriculum curriculum and according to the criteria set by the competent educational authorities. The course provides the facilitator with the basic topics related to the objectives of the syllabus. One row. CFBT (Center for British Teacher) is an educational institution outside the British Ministry of Education and Science that provides educational services for the public good in the UK and around the world. Preparatory stage: This is the pre-university stage, where the study is three years after the middle school in the educational system of education in Iraq. The study was conducted in Palestine. The aim of the study was to determine the level of quality
of engineering and measurement subjects in books in Palestinian mathematics books in the basic education stage in the light of British standards (CFBT). The study sample was in mathematics books in each grade of the basic stage. In this study the descriptive analytical method, where the researcher analyzed the topics of engineering and measurement in the mathematics books for the grades of the basic stage of (1-10), and the researcher used in this study frequencies and percentages as statistical treatments, and the study found that all engineering topics in mathematics textbooks, Its not up to the level of quality, as it did not reach an acceptable educational limit only in basic first grade and in the light of the results of the study showed the researcher recommends: Dependence on scientific foundations and global standards when developing and building engineering and measurement topics in mathematics books. Benefit from the list of criteria (CFBT) mentioned in this study in the development of the content of engineering and measurement topics.

The problem of research: Today’s textbooks suffer from shallow and poor production, fragile infrastructure, weak and narrow book ideas and the economic crisis reflected on the cultural market. A task no less important than the process of building and evidence of that if we have prepared a curriculum with all the forms of technology and modern progress and neglected this approach for several years will be dominated by palaces and underdevelopment 6-8. As the content of the textbook is a cornerstone of the curriculum and is one of the most important inputs, educators stressed the content of the type and organization and choice, especially as we live in an era of accumulated knowledge and witness the revolution in the enormous information, which requires the authors of the curriculum to choose the content based on the objectives of education And the development of criteria for the selection of content in the light of educational goals and the decision to judge the extent to which the content of the requirements of the objectives of education requires analysis of the components and quantitative description has become a content analysis is required of materials to build and evaluate the curriculum 9-11. The importance of research: The textbook is one of the most important educational materials, used by the student and the teacher and affect greatly what will be taught and learned (Eisner, 1987), Down (1988) confirmed the control of the textbook on what students will learn as it determines the content of the curriculum, That community members make the textbook a reliable and accurate source of information, says Yager (1983), when he summarized the status of education education as a science textbook. Yager & Penick notes that 90% of the teachers rely on textbooks as 95% as the only source 10. Therefore, it is necessary to analyze the content of the textbook and ensure that it complies with modern standards. According to Shield, (2005), the need to analyze the textbook in view of the achievement of certain criteria. Research Methodology The researcher followed the analytical descriptive method to analyze the content of the physics book for the fourth grade according to the criteria of the CFBT. The researcher adopted the method of content analysis to achieve the research objective. Research Society and Design: The research community is represented in the physics book to be taught in Iraq for the fourth grade preparatory year (2017 - 2018), which represents a statistical society. The research sample consisted of all subjects included in the content of the physics book to be taught to the fourth grade students in Iraq for the academic year (2017 - 2018), which is the research community itself. Research tool: To achieve the goal of the research, the researcher used the method of content analysis, which describes the content shown objectively, logically and quantitatively in the light of the unit of analysis used. This research requires the preparation of a tool to analyze the content of the book of physics for the fourth grade in Iraq (2017-2018). The tool must include criteria for analysis, so the researcher has taken the following steps to build this tool:

See literature and previous studies.

Reliance on criteria (CFBT) translated by the researcher.

To obtain the tool, the research objective was to translate the list of criteria (CFBT) from English to Arabic. The list included nine areas of fifty-seven criteria which are learning outcomes that the student should reach at the end of his / her physics course.

Tool Validation:

Present the standards translated into Arabic with the English standards on a group of specialists in English, in order to determine the accuracy of the translation and its clarity. Experts and specialists agreed (80%) on the validity of translation.

Present the standards translated into Arabic
a group of arbitrators and specialists in educational and psychological sciences in order to determine the adequacy of the standards for the Iraqi environment and verify the veracity of the tool. The experts and specialists agreed (80%) on the adequacy of standards for the Iraqi environment. Measure what has been prepared to measure it.

**METHODOLOGY**

**Analysis procedures:** The researcher followed the following steps in the analysis process, and can be summarized:

- Obtain a list of criteria standards (CFBT).
- Read the whole topic a good read, to clear the picture in the analyst’s mind.
- Read the same topic a second time carefully to identify the idea that contains.
- Comparing the idea with the clauses of the tool (CFBT standards) to determine the relevance of the idea to the main issues and sub-issues according to the correspondence between the content of the idea and the content of the case in the tool.
- The type of the idea is then determined in the statements in the light of the tool and determine the type of case and determine its number that determines the type of statement.
- Calculate the frequency of availability of standards for each field in the physics book content.

**Stability of the tool:** The researcher used two types of stability: The researcher analyzed the content again with a time interval of (twenty days) between the first and second analyzes. The coefficient of stability between the two analyzes (95%), Which is a good stability coefficient, since the stability of more than 70% is good, as shown in Table (4). The researcher analyzed the same material with another analyst, after being trained on how to analyze using the rules and procedures of the analysis itself. The Cooper equation was used to find the coefficient of stability, where the stability between the researcher and the analyst (89%) and Table (7) This explains.

**Statistical Methods:** The researcher used the following statistical and accounting methods:

Cooper’s equation to calculate the stability ratios of analysis.

Kai box to calculate the proportion of expert agreement.

The percentage and arithmetic mean of the calculation of the frequencies in the analysis.

**RESULTS AND DISCUSSION**

First: The results of the analysis of the content of the book of physics for the fourth grade preparatory according to the criteria (CFBT): After the researcher analyzed the content of the fourth grade book in accordance with the criteria of (CFBT), the data for the results of the analysis for each of the nine fields are included in the table 1. In the table above, we find that all the standards are not achieved, with the ratio of the first criterion (0%), while the ratio of the second criterion (4.16%), while the ratio of the third criterion (0%) with the ratio of the fourth criterion (4.6%), while the ratio of the sixth criterion (0%), while the ratio of the seventh criterion (4.33%) with the ratio of the eighth criterion (2.08%). Ninth (12.5%) was the total ratios for all criteria (30%).

<table>
<thead>
<tr>
<th>percentage</th>
<th>Repetition</th>
<th>field</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0</td>
<td>energy</td>
</tr>
<tr>
<td>4.16%</td>
<td>2</td>
<td>Powers</td>
</tr>
<tr>
<td>0%</td>
<td>0</td>
<td>Forces and movement</td>
</tr>
<tr>
<td>4.16%</td>
<td>2</td>
<td>Wave motion</td>
</tr>
<tr>
<td>6.25%</td>
<td>3</td>
<td>electrical</td>
</tr>
<tr>
<td>0%</td>
<td>0</td>
<td>Magnetic and Electrical</td>
</tr>
<tr>
<td>8.33%</td>
<td>4</td>
<td>Subject</td>
</tr>
<tr>
<td>2.08%</td>
<td>1</td>
<td>Atomic structure</td>
</tr>
<tr>
<td>12.5%</td>
<td>6</td>
<td>Space physics</td>
</tr>
<tr>
<td>30%</td>
<td>18</td>
<td>Total</td>
</tr>
</tbody>
</table>
CONCLUSION

The first field (energy), the third field (forces and movement) and the sixth field (magnetism and electrical) are included in the book of physics for the fourth grade. This is because there are no classes containing these subjects in the book of physics for the fourth grade. The ninth area (space physics) got the highest frequency, due to the existence of a full chapter includes topics of space physics in the book of physics for the fourth grade preparatory. The results show low standards in the content of the book of physics for the fourth grade preparatory, because of the lack of interest of the authors of the methodology to include it.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Graduate Studies - Methods of Teaching General Sciences, Faculty of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Assessment of Quality of Nursing Care for Premature Baby during Nasogastric Tube Feeding in Neonatal Intensive Care Unit at al-Batool Teaching Hospital in Diyala Governorate

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ABSTRACT

The study aim to assess quality of nursing care for premature baby during nasogastric tube feeding in neonatal intensive care unit through assess of quality of nursing performance for premature baby during nasogastric tube feeding in neonatal intensive care unit and to find out the relationship between quality of nursing performance for premature baby during nasogastric tube feeding and socio-demographic characteristics with certain variables. Non-probability purposive sample of (25) nurses working in the neonatal intensive care unit. The data were collected through the use of Observational instrument which consist of socio-demographic characteristics, quality of nursing care. The study shows that the majority of participants was female with age (20-29) years with diploma and more half was married with somewhat sufficient of monthly income, years of experience in nursing and neonatal intensive care unit were, quality of care before, during, and after at fair level. The overall quality of nursing care regarding nasogastric feeding tube with for most of participants was at a fair level.

Keywords: Assessment, Quality of Care, Premature, Nasogastric Tube

INTRODUCTION

Neonate is delivered at premature, term or complete term and has no troubles, some neonates may have medicinal problems relevant to factors that occur before delivery like any health troubles or pattern of the mother and certain birth defects are likely to lead to early childbirth ¹. A neonatal period is the first 28 days of a newborn life. High risk neonate, regardless of birth weight, size, or gestational age, has increased incidence of morbidity and mortality rate, so that neonate required special care, and admitted to Neonate Intensive Care Unit (NICU)². This assist in maintaining normal metabolism during the metamorphosis from fetal to extrauterine environment ³. A nutritional deficiency is a serious problem for high risk neonates. The enteral nutrition (EN) is the best method to promote adequate nutrition via naso-gastric tube pass from the nose to the stomach. May be pass from the nose is called a nasogastric tube (NGT). Which important prior nutrition intervention support for prematurity newborns and high-risk neonates, as it supplies nutritional requirements when newborns have difficulties in oral intake ⁴. Enough feeding is essential for the best growth and health of very low birth weight (VLBW) infants. Enteral feeding is favorate to total parenteral nutrition (TPN) because the prior avoids complications related to vascular catheterization, sepsis, negative effects of TPN, and fasting⁵. World Health Organization, guidelines for nutrition of LBW babies have not been obtainable. A quality of care recipient by LBW infants in many low- and middle-income countries is insufficient. These infants are often not breastfed and many times not fed at all in the first hours and days of life ⁶. Quality of care is eventually much more intricate, therefore, nurses who are involved in quality amelioration or execution of evidence-based practice, should be experience with the question of how measurement of QoC ⁷,⁸. Briefness and refinement babies care elaboration active participating of each one in health care system, so as to meet the requirement for estimating health care in its whole as...
well as to identify whether active and suitable care has been provided. The quality is “the main component of neonatal health care, and it demands contribution from nurses interpreting care”. Nurses play an important role in ensuring the success of this nutritional approach through properly managing patients feeding tube.

**MATERIALS AND METHOD**

This chapter describes the methods with which the study objectives were achieved: design of the study, administrative arrangement, study setting, study sample, data collection, inclusion criteria, exclusion criteria, study instrument, pilot of study, validity and reliability, statistical analysis and ethical consideration. Descriptive (correlational) study design performed on quality of nursing care for premature baby during nasogastric tube feeding in neonatal intensive care unit. The present research started from the 4th of December 2017 to 24th of April 2018, in order to assess nursing performance during nasogastric feeding tube placement in NICU.

**Setting of the Study**

The study has been conducted in Neonatal Intensive Care Unit NICU at Al- Batool Teaching Hospital.

**Sample of the study**

The total sample included (40 nurses), only (5 nurses) were recruited to participate in the Pilot study and (10 nurses) were excluded from being invalid for research criteria. Thus the actual sample size was (25) nurses was purposive selected through a non-probability technique. These nurses worked at neonatal intensive care unit in hospital that have such facilities to provide premature baby nursing care with nasogastric feeding tube.

**RESULTS AND DISCUSSION**

Most of study participants are within the age group of (20-29) years-old (n = 19; 76.0%), followed by those who age (30-39) years-old (n = 6; 24.0%). Concerning gender, all participants are females (n = 25; 100.0%).

Regarding educational qualification, two-fifth hold an associate degree “Diploma” (n = 10; 40.0%), followed by those who are nursing high school graduates (n = 9; 36.0%), and those who hold a bachelor’s degree (n = 6; 24.0%). With respect to marital status, more than a half are married (n = 13; 52.0%) compared to not married participants (n = 12; 48.0%). Concerning years of experience in nursing, the years mean is 4.7 ± 4.7; the majority have (1-5) years of experience in nursing (n = 20; 80.0%), followed by those who have 11 years or more (n = 3; 12.0%), and those who have (6-10) years (n = 2; 8.0%).

Regarding years of experience in NICU, the years mean is 2.4 ± 2.9; the vast majority have (1-5) years of experience in NICU (n = 23; 92.0%), followed by those who have each of (6-10) years and 11 years or more (n = 1; 4.0%). With respect to residency, all participants live in urban areas (n = 25; 100.0%). Concerning monthly income, most reported that they have somewhat sufficient income (n = 15; 60.0%) compared to those who have sufficient income (n = 10; 40.0%). The majority reported that they didn’t participate in any training course related to NG tube (n = 21; 84.0%) compared to those who participated in such courses (n = 4; 16.0%). All these courses were held inside Iraq (n = 4; 100.0%). Concerning participants’ age, most of study participants are within the age group of (20-29) years-old, followed by those who age (30-39) years-old with percent(24.0%) nurses. This finding agrees with Zaki (2014) who found that less than two thirds of the studied nurses’ age were from 20-30 years with mean age of 22.8±0.52, and agree with AL-Hawaly (2016) who found that more than half of the nurses their ages ranged between (20-25) years. Regarding gender, all participants were females. This finding agrees with AL-Hawaly (2016) who found that (93.3%) of study participants were females. Concerning the subjects’ marital status, more than a half of the study participants are married. This finding is consistent with that of Abd El Fattah and others (2009) who found that most of study participants were married. Regarding the years of experience in nursing, the years mean is 4.7 ± 4.7; the majority have (1-5) years of experience in nursing, followed by those who have 11 years or more. This finding agrees with that obtained by Abd El Fattah and others (2009) who found that around a half have (1-5) years of experience, and Consistently, this finding agrees with that of Ahamed and Mondal (2014) who reported that 60% of participants had 0–<1 year of experience, 26% had1–<2 years, 12% had 2–<3 and only 2% had 3 or more years of experience. Regarding nurses’ performance pre-NGT, the study findings revealed that participants have poor level of performance for the items (Prepare of trolley for equipment preparation, Sterilize trolley between patient and another, and mark size of the nasogastric tube by a marker or tape after measure it). This finding is supported by AL-Hawaly.
and others (2016) who found that more than half of the studied nurses had an unsatisfactory level of practice regarding care given before NG feeding tube, then these concur with Metwaly (2013) who mentioned that levels of performance as regards to pre-administration of medication via nasogastric tube were unsatisfactory less than two third and approximately one-half of the studied sample incorrectly practice this procedure (Table 1). On the other hand, nurses have poor performance during NGT procedure for the items (moisturize the edge of the tube with steril water again if insertion by the another opening, withdraw of tube if signs of respiratory distress occur: cyanosis, prolong cough, tachypnea, fix the nasogastric tube on the baby’s nose or upper lip using adhesive tape, and use of stethoscope to check the pathway of the nasogastric tube). This finding agrees with that of Ahmed (2009) who found that nurses’ performance were incompetent for the aforementioned items. (Table 2). In addition to that nursing performance related nasogastric tube procedure in item dealing with (connect the tube with the feeding equipment or need a valve according to the doctor’s order) with mean (SD) = 2.01 ± 0.20, this result clarified that fair assessment of nursing performance related feeding practice this goes back that related of the patient administrating of feeding to the baby in neonatal intensive care unit (Researcher) (Table 3).

Table 1. Quality of nursing care before nasogastric tube procedure.

<table>
<thead>
<tr>
<th>Items</th>
<th>Observation 1</th>
<th>Observation 2</th>
<th>Observation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA (f %)</td>
<td>AI (f %)</td>
<td>A (f %)</td>
</tr>
<tr>
<td>1. Hands washing</td>
<td>14 (56%)</td>
<td>4 (16%)</td>
<td>7 (28%)</td>
</tr>
<tr>
<td>2. Wearing sterile</td>
<td>2 (8%)</td>
<td>23 (92%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Wearing a face</td>
<td>19 (76%)</td>
<td>0 (0.0%)</td>
<td>6 (24%)</td>
</tr>
<tr>
<td>mask</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Wearing a sterile</td>
<td>1 (4%)</td>
<td>0 (0.0%)</td>
<td>24 (96%)</td>
</tr>
<tr>
<td>gown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Wearing cover</td>
<td>1 (4%)</td>
<td>0 (0.0%)</td>
<td>24 (96%)</td>
</tr>
<tr>
<td>shoes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Preparing the</td>
<td>1 (4%)</td>
<td>18 (72%)</td>
<td>6 (24%)</td>
</tr>
<tr>
<td>equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. Quality of nursing care during nasogastric procedure

<table>
<thead>
<tr>
<th>Items</th>
<th>Observation 1</th>
<th></th>
<th>Observation 2</th>
<th></th>
<th>Observation 3</th>
<th></th>
<th>* Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA (f %)</td>
<td>AI (f %)</td>
<td>A (f %)</td>
<td>NA (f %)</td>
<td>AI (f %)</td>
<td>A (f %)</td>
<td>NA (f %)</td>
</tr>
<tr>
<td>Making sure that the position of the baby in 30-40 degrees</td>
<td>2 (8%)</td>
<td>20 (80%)</td>
<td>3 (12%)</td>
<td>4 (16%)</td>
<td>14 (56%)</td>
<td>7 (28%)</td>
<td>3 (12%)</td>
</tr>
<tr>
<td>Wetting the edge of the nasogastric tube with a sterile water</td>
<td>1 (4%)</td>
<td>11 (44%)</td>
<td>13 (52%)</td>
<td>0 (0.0%)</td>
<td>6 (24%)</td>
<td>19 (76%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Insert the nasogastric tube through the nasal opening gently</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>25 (100%)</td>
<td>1 (4%)</td>
<td>0 (0.0%)</td>
<td>24 (96%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Removing the nasogastric tube if there is an obstacle</td>
<td>14 (56%)</td>
<td>1 (4%)</td>
<td>10 (40%)</td>
<td>11 (44%)</td>
<td>7 (28%)</td>
<td>7 (28%)</td>
<td>13 (52%)</td>
</tr>
<tr>
<td>Wetting the edge of the tube with sterile water again when its inserted by another opening</td>
<td>23 (92%)</td>
<td>1 (4%)</td>
<td>1 (4%)</td>
<td>15 (60%)</td>
<td>6 (24%)</td>
<td>4 (16%)</td>
<td>13 (52%)</td>
</tr>
<tr>
<td>Withdrawing of the tube when vomiting occur into the baby</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>25 (100%)</td>
<td>5 (20%)</td>
<td>9 (36%)</td>
<td>11 (44%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Withdrawing of tube if signs of respiratory distress occur:</td>
<td>20 (80%)</td>
<td>2 (8%)</td>
<td>3 (12%)</td>
<td>13 (52%)</td>
<td>5 (20%)</td>
<td>7 (28%)</td>
<td>18 (72%)</td>
</tr>
<tr>
<td>cynosis, prolong cough, tachypnea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Quality of nursing care after nasogastric procedure.

<table>
<thead>
<tr>
<th>Items</th>
<th>Observation 1</th>
<th></th>
<th>Observation 2</th>
<th></th>
<th>Observation 3</th>
<th></th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA (f %)</td>
<td>AI (f %)</td>
<td>A (f %)</td>
<td>NA (f %)</td>
<td>AI (f %)</td>
<td>A (f %)</td>
<td></td>
</tr>
<tr>
<td>28. Connecting the tube to the feeding equipment or need a valve</td>
<td>15 (60%)</td>
<td>0 (0.0%)</td>
<td>10 (40%)</td>
<td>10 (40%)</td>
<td>0 (0.0%)</td>
<td>15 (60%)</td>
<td>2.01 ± .20</td>
</tr>
<tr>
<td>according to the doctor’s order</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Removing personal protective equipment: gloves, mask</td>
<td>3 (12%)</td>
<td>0 (0.0%)</td>
<td>22 (88%)</td>
<td>3 (12%)</td>
<td>5 (20%)</td>
<td>17 (68%)</td>
<td>2.69 ± .11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>30. Disposing of medical waste in safe places</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>25 (100%)</td>
<td>0 (0.0%)</td>
<td>2 (8%)</td>
<td>23 (92%)</td>
<td>2.96 ± .04</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Hand washing</td>
<td>22 (88%)</td>
<td>0 (0.0%)</td>
<td>3 (12%)</td>
<td>15 (60%)</td>
<td>5 (20%)</td>
<td>5 (20%)</td>
<td>1.61 ± .38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Follow up the health status of the premature baby</td>
<td>0 (0.0%)</td>
<td>2 (8%)</td>
<td>23 (92%)</td>
<td>2 (8%)</td>
<td>4 (16%)</td>
<td>19 (76%)</td>
<td>2.81 ± .12</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Recording the information of nasogastric tube insertion like,</td>
<td>5 (20%)</td>
<td>5 (20%)</td>
<td>15 (60%)</td>
<td>3 (12%)</td>
<td>7 (28%)</td>
<td>15 (60%)</td>
<td>2.38 ± .10</td>
</tr>
<tr>
<td>date and time, size and type of tube, extent of baby response to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>procedure</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

The overall quality of nursing care regarding nasogastric feeding tube with for most of participants was at a fair level. Years of experience in nursing, years of experience in NICU, the educational qualification, marital status, monthly income, and training courses related to NG tube were not influential factors in the overall nursing quality of care.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Pediatric Nursing, College of Nursing, University of Baghdad, Baghdad city, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

2. Kleigman RM, Behrman RE, Jenson HB. Nelson


Detection of the Relationship between the Intensity of Infection **Contracaecum Sp** (Ascaridoidea) Larvae and Feeding of Freshwater Fish Caught in Samawahh City

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**College of Education for Pure Sciences, AL-Muthanna University, Samawahh City, Iraq**

**ABSTRACT**

The present investigation represents the first study on feeding and parasites of *Carasobarbus luteus* from Euphrates River in Samawah city during the period from October 2017 to June 2018 from three stations to provided predictive equation for the relationships between food consumption and parasitic infection. The current study was showed that there are five nutrients that can be taken up by fish. Plant parts were of great importance in feeding *Carasobarbus luteus* fish, with the highest value of Index of relative importance IRI% (32.605) followed by crustaceans (22.349), insects (20.33), algae (18.916) and organic detritus record lowest value (17.779) that means the fish of this study belong to Omnivorous group. Statistical analysis indicated no significant differences are found in food items. Indicate that male and female *Carasobarbus luteus* fish are infected with *Contracaecum sp* larvae in the third stage, the statistical analysis showed that there are significant differences in the incidence of *Contracaecum sp* larvae parasites among males and females. The highest incidence was recorded in females compared to male fish, the total mean for the intensity of infection was (1.0667, 1.633) in both sexes respectively.

**Keywords:** Algae, Feeding habits, Nematoda worm, parasitic infections

**INTRODUCTION**

The importance of fish as food has been understood by man from antiquity and fishery is regarded as a powerful in come and employment generator as it stimulates the growth of a number of subsidiary industries, this is also an exchange earner besides providing balanced protein food for all classes of people. *Carasobarbus luteus* is a small fish the upper, back flank is brownish, It is found in the Mesopotamia basin and the southern marshes, in river (such as Euphrates, Tigris, Diyala and Little Zab), in some lake (such as Razazzah, Habbaniyah and Tharthar) and in reservoirs (such as Derbendikhan and Dukan), although it is a freshwater species, it was seen in advanced areas of the mouth of Shatt al-Arab towards the Arabian Gulf. The main factors that assist in the spread of parasitic infections include parasitic factors (parasite type, number of parasite and pathogenicity), host factors (eg, host type, age, sex, behaviour, feeding), environmental factors (including various biological and non-biological factors). The nematode includes Ascaridoidea family and many freshwater fish can play a role in spreading the infection because they are considered the intermediate or carrier of these parasites, whereas mammalian and fowl fish are considered to be the definitive hosts. The most common genera are Pseudoteranova, Anisakis and contracaecum, which have similar life cycles, usually have the third stage of parasite larvae in mesentery, the body cavity and bronchial chambers of many fish while there is the adult stage in the intestines of birds that eat fish. Parasites directly affect their hosts by obtaining host energy and food, and indirectly by increasing the activity of the immune system, in addition to the ability of the parasite to change the behaviour and quality of food a teen by the host, While the parasite effect on the fish host may increase with reduced availability of resources which causes the determination of the quantities of food used for the growth and maturity of fish this effect is called.
reproductive damage. Cell proliferation: A single cell can affect a fish where it causes an abnormal increase in cell division which is similar to cancer in humans for example, carcinogenesis during the promotion and initiation, parasite caused epithelial cell proliferation which commonly found in Atlantic salmon, this increase in the number of cells impede the function of some important organs such as the liver or anther organs, this effect is called physiological damage. The present study considers the first investigation about the feeding and parasites of this species in Samawah city.

MATERIALS AND METHOD

Collection of samples

250 specimens were collected monthly from Euphrates River during the period from October 2017 to June 2018 from three stations, the distance between each three station was approximally 1-3 km, located between latitude 31°19'N and longitude 45°17'E. Gills nets were used ( seine nets ,Length 60 meters, width 4 meters, 2 X 2 cm mesh size in three stations. Each gill net was used three times for 1 hour each time. The sampling time was about 4 hours for each station. All captured fish were measured total length, weight and sex identification in the laboratory. Fish were diagnosed depending on the method described by the

Analysis of intestinal contents, isolation and diagnosis of parasites:

The fishes were opened using scissor started from the opening of the anus to the opening of the mouth, and then examining the internal cavity, internal organs, digestive tract isolation and its accessories were examined, depending on the method described by the. Two mg of the sample was placed on a glass slide and examined using a compound microscope (40x). Food habits were studied using methods described by the, the methods were Frequency, Occurrence method, volumetric method and Numerical method. Index of relative importance (IRI %) was calculated according to the following equation

$$\text{IRI}_i = \left(\frac{\%N_i + \%V_i + \%O_i}{3}\right) \times 100$$

Where $N_i$, $V_i$ and $O_i$ represent percentages of number, volume and frequency of occurrence prey $i$ respectively.

Intestinal length ratio was calculated according to the following equation

$$\text{Intestinal length ratio} = \frac{I}{B}$$

The nematode was isolated and placed in test tubes containing a saline solution to remove the suspended residues. It was then tested with a 70% alcoholic solution. Parasites were diagnosed depending on the. The parasites were filmed using a Japanese-made Sony camera (cyber-shot, 14.1 mega pixels). The intensity of infection for nematodes (Contracaecum sp larvae) were calculated.

Statistical analysis

Statistical program SPSS (20) and the application of T-test were used to determined that the differences in the intensity of infection between two sexes is significant or not significant at ($p \leq 0.05$) and Microsoft Windows 13 was used for the rest of the calculations.

RESULTS AND DISCUSSION

A Total of Carasobarbus luteus were 250 samples divided into 75 males’ samples and 175 females’ samples, where they studied the components of their food and parasites are listed in Table1.

Index of relative importance IRI%

Table (2) shows that there are five nutrients that can be taken up by fish of the current study and that these nutrients play a role that varies in importance during the months of the study depending on the lengths reached by the fish. The results showed that plant parts (stems, roots and leaves) were of great importance in feeding Carasobarbus luteus fish, with the highest value (32.605) followed by crustaceans (22.349), insects (20.33), algae (18.916) and organic detritus record lowest value (17779). Statistical analysis indicated no significant differences are found in food items which consumed by fish in both sexes. The relative importance index, on the other hand showed lower and higher values during the months of study due to the fluctuation in water temperature, food arability and fish activity. pointed out that the seasonal variations of B. luteus food components according to the importance index showed that algae recorded the highest percentage of importance (40.86%) while aquatic plants and diatoms were ranked second and third, while the lowest value was non diagnosed food (0.54%), algae increased in spring and summer, while autumn and summer recorded the highest values of aquatic plants. Diatoms, Crustaceans, Mollusca and insects recorded highest values in winter.
Table (3) shown that fish belong to Omnivorous group where the value of intestinal length ratio ranged between (1.1-1.2), the results of this study is somewhat consistent with what was indicated by 11. The results of the study agree with study by 14,15 that which indicated a large algal dominance, accounting for more than 50% of the food in B. luteus is sovereign in feeding plants in large lengths and tends to feed the animal in small lengths. As well as consistent with the study 2 was pointed out that the containment the intestines of these fish on large plants, insects and organic detritus. and disagree with 16,17 in the southern Iraqi marshes which indicated a large algal dominance, accounting for more than 50% of the food in B. luteus and disagree with 13 showing that algae accounted for the highest percentage of 30.13% in Hilla River.

The intensity of infection Contracaecum sp larvae

Tables (4 and 5) indicate that male and female Carasobarbus luteus fish are infected with Contracaecum sp larvae in third stage belonging to Class Nematoda, Order Ascaridoidea. The results of the current research recorded the presence of parasite Contracaecum sp larvae in the intestines of the fish in most months of the study was the highest intensity of infection with this parasite during the month of June 2.5 and 2.7 were the mean of total length and weight 18.1cm, 86 gm, 18 cm, 83.56 gm for both sexes respectively, while the lowest intensity of infection was 1 for both sexes in December for males where it was The mean total length and weight was 22.23cm and 136.1 gm. and female was 19.5cm, 133 gm in February. The parasite was not recorded during the months of October, January in male’s fish. This is due to increased activity of small fish feeding on Plant parts, crustaceans, insect, algae and Organic detritus (Table 2), as well as the passage of large amounts of water during the gills to get the largest amount of oxygen as a necessary for the growth of these fish, which was associated with increased parasite activity, which provides greater opportunities for infection, in addition, increasing the locomotor activity in large fish to provide the appropriate environmental conditions as well as the availability and diversity of plant and animal nutrients close to fish, especially pant parts and Crustacea (Table 2). The lack of registration in some months may be due to the parasite is optional infection affects fish and other aquatic animals present in the study area. The statistical analysis showed that there are significant differences in the incidence of Contracaecum sp larvae parasites among males and females. The highest incidence was recorded in females compared to male fish, the total mean for the intensity of infection were (1.0667, 1.633) in both sexes respectively. This is probably due to the fact that females numbers more than the number of males caught in the current study. This is due to the nature of the fish population composition for this fish (Sex ratio 1/4) (Table 1). On the large size of female gonads, prompting the females to get the largest amount of food available in their environment for the growth of their gonads. The results of the current study are consistent with the result indicated by 18 in River Tigris passing Baghdad, pointed to the presence of parasite larvae in Aspius vorax, Chondrostoma regium, Garra rufa and Mystus pelusis, with a percentage of infection of 42, 32, 18 and 8, respectively, and The intensity of infection at 11.5,7.6, 3.2 and 3.3 respectively.

A number of studies have been conducted on internal parasites which infected fish family: Cyprinidae in the water bodies and fish farms in different parts of Iraq, including the study of 19 (for the first time in Iraq) was recorded a parasitic infection by parasite Myxobolus oviforms in various species of fish belonging to the carp family collected from different parts of Iraq 20. Moreover, the current research results are consistent with 4 at Lake Nasser, Egypt they found four fish belonging to fresh water fish were infected with Contracaecum sp larvae in third stage. The lack of registration in some months may be due to the parasite is optional infection affects fish and other aquatic animals present in the study area.

Table 1. A total number of fishes caught and aged on each sex.

<table>
<thead>
<tr>
<th>Number aged</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>250</td>
<td>175</td>
</tr>
<tr>
<td>Sex ratio</td>
<td>1/4</td>
<td></td>
</tr>
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</table>
Table 2. Monthly changes in the dietary components of *Carasobarbus luteus* to calculate the relative importance index.

<table>
<thead>
<tr>
<th>Month</th>
<th>Crustacea</th>
<th>Organic detritus</th>
<th>Insects</th>
<th>Algae</th>
<th>Plant parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2017</td>
<td>1.27</td>
<td>5.56</td>
<td>23.45</td>
<td>45.56</td>
<td>28.56</td>
</tr>
<tr>
<td>November</td>
<td>1.11</td>
<td>10.45</td>
<td>30.47</td>
<td>12.45</td>
<td>23.45</td>
</tr>
<tr>
<td>December</td>
<td>9.32</td>
<td>23.45</td>
<td>34.78</td>
<td>20.36</td>
<td>25.96</td>
</tr>
<tr>
<td>January</td>
<td>10.78</td>
<td>30.5</td>
<td>22.60</td>
<td>22.45</td>
<td>20.67</td>
</tr>
<tr>
<td>February</td>
<td>22.69</td>
<td>28.67</td>
<td>31.89</td>
<td>15.58</td>
<td>43.56</td>
</tr>
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<td>March</td>
<td>29.50</td>
<td>15.23</td>
<td>15.56</td>
<td>13.78</td>
<td>50.48</td>
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<td>April</td>
<td>30.12</td>
<td>13.34</td>
<td>10.45</td>
<td>11.90</td>
<td>51.53</td>
</tr>
<tr>
<td>May</td>
<td>45.90</td>
<td>12.57</td>
<td>8.21</td>
<td>10.67</td>
<td>38.90</td>
</tr>
<tr>
<td>June 2018</td>
<td>50.45</td>
<td>20.24</td>
<td>5.56</td>
<td>17.49</td>
<td>10.34</td>
</tr>
<tr>
<td>Mean</td>
<td>22.349</td>
<td>17.779</td>
<td>20.33</td>
<td>18.916</td>
<td>32.605</td>
</tr>
</tbody>
</table>

Table 3. Comparison of the intestinal length ratio values of different fish with the current study fish.

<table>
<thead>
<tr>
<th>Source</th>
<th>Scientific name of fish</th>
<th>Intestinal length ratio values</th>
<th>Feeding habits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond, 1979</td>
<td><em>Salmo salar</em></td>
<td>0.73-0.80</td>
<td>Carnivorous</td>
</tr>
<tr>
<td></td>
<td><em>Gadus morhua</em></td>
<td>1.05-1.50</td>
<td>Carnivorous</td>
</tr>
<tr>
<td></td>
<td><em>Hypophthalmichthys molotrix</em></td>
<td>4.6-7.1</td>
<td>Herbivorous</td>
</tr>
<tr>
<td></td>
<td><em>Gila bicolor</em></td>
<td>1.0-1.3</td>
<td>Omnivorous</td>
</tr>
<tr>
<td></td>
<td><em>Ptychocheilus oregonensis</em></td>
<td>0.7-0.9</td>
<td>Carnivorous</td>
</tr>
<tr>
<td></td>
<td><em>Micropterus salmoides</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Labeo calbasu</em></td>
<td>3.75-10</td>
<td>Herbivorous</td>
</tr>
<tr>
<td></td>
<td><em>Jordanella floridai</em></td>
<td>2.5-2.7</td>
<td>Herbivorous</td>
</tr>
<tr>
<td>Alasadiy, 2018</td>
<td><em>Carasobarbus luteus</em></td>
<td>1.1-1.2</td>
<td>Omnivorous</td>
</tr>
</tbody>
</table>
Table 4. Monthly changes in the intensity of infection *Contracaecum sp* larvae of male *Carasobarbus luteus*.

<table>
<thead>
<tr>
<th>Months</th>
<th>Mean of total length (cm)</th>
<th>Mean of total Weight (gm)</th>
<th>The intensity of infection</th>
<th>site of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>17.5</td>
<td>80.33</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>17.8</td>
<td>81.77</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>22.23</td>
<td>136.1</td>
<td>1</td>
<td>Intestine</td>
</tr>
<tr>
<td>January</td>
<td>20.5</td>
<td>125.2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>22.8</td>
<td>154</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>23.5</td>
<td>160</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>22.9</td>
<td>158</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>15</td>
<td>57</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>18.1</td>
<td>86</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Total mean</td>
<td>20.037</td>
<td>115.378</td>
<td>1.0667</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Monthly changes in the intensity of infection *Contracaecum sp* larvae of female *Carasobarbus luteus*.

<table>
<thead>
<tr>
<th>Months</th>
<th>Mean of total length (cm)</th>
<th>Mean of total Weight (gm)</th>
<th>The intensity of infection</th>
<th>site of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>20.5</td>
<td>154</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>21.5</td>
<td>160</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>22.24</td>
<td>139</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>20.8</td>
<td>133.2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>19.5</td>
<td>133</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>22.1</td>
<td>137</td>
<td>1.7</td>
<td>Intestine</td>
</tr>
<tr>
<td>April</td>
<td>24.5</td>
<td>168</td>
<td>2.05</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>14.6</td>
<td>68</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>18</td>
<td>83.56</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Total mean</td>
<td>20.416</td>
<td>130.64</td>
<td>1.633</td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSION**

Current research results indicate that the intensity of infection with this parasite increases with age and size of fish (Table 4 and 5) and this is consistent with (25) and (26), as they indicated, Nematoda worm is one of the most prevalent worms, especially in freshwater fish around the world, which is of economic importance because it causes little fish resistance to diseases, making its susceptible to other injuries.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Education for Pure Sciences, AL-Muthanna University, Iraq and all experiments were carried out in accordance with approved guidelines.
REFERENCES


Effect of Dietary Educational Program on Self-Care Efficacy for Patient Schedule for Regular Hemodialysis

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1Warith alanbiyaa University, Adult Nursing Department, College of Nursing, 2Adult Nursing Department- University of Babylon, 3Community Nursing Department- University of Babylon

ABSTRACT

There is different problems particularly nutritional problems, affect different aspects of life for patients undergoing hemodialysis. They need specific educational intervention to balance fluid and food consumption. Objective: To evaluate the effect of dietary educational program upon self-care for patients who undergoing hemodialysis. Qausi-experimental design carry out to evaluate the effect of self-care educational program upon patients scheduled for hemodialysis in hemodialysis center at Al-Hilla city, from (25. October. 2017) to (12. August. 2018). to achieve the objective of the study purposive (non-probability) sample where selected which consists of (50) patients with end stage renal disease who undergoing hemodialysis. The dominate characteristics of the participants who involved in the study (control and experimental group) presented that the higher percentages of the subjected 10(40%) and 14(56%) were between (51yrs. and more) years of age. Related to gender 14(56%), female in control group and 15 (60%) male in experimental group, high percentage in both group were married and retired. Most of the response (pre and posttest) among the control group who receive routine care in the hemodialysis unit were (poor) related to (dietary content). All the responses (post-test) during dialysis session were (good) related to (protein, sodium, potassium, and phosphor, fluid).

Keywords: Effect, Dietary, Educational Program, Self-Care, Efficacy, Hemodialysis.

INTRODUCTION

Long-term treatment with dialysis, produce various problems particular nutritional which threatening patients life these patients require changes in their lifestyle and nutritional status in order to cope and manage their disease. They need specific educational intervention to balance fluid and food consumption. Treatment of these patients without their participation and doing some self-care activities is not enough 1. Self-efficacy is extension to self-care concepts which depend on the individual capabilities in specific condition, its understanding skills and abilities to fulfill a successful performance, health care 2. Patient who suffer from chronic disease always not be able to carry out treatment regiments properly, health care providers specifically nurses has a critical role regarding enhancement of patient self-efficacy, improving knowledge enhance practices, help to choice and make decision to maintain their life decrease complication and reduce unnecessary hospitalization 3. To help the kidney act efficiently decrease dietary sodium, potassium, phosphate, fluid and protein should be taken place. Early dialysis management is centralize on decreasing sodium usage, because excessive sodium in the diet can progress kidney problems because its effect on blood pressure which effected directly up on kidney function 4. Key factors to maintain proper quality of life in the early stage of the disease is weight management with increasing physical activities. In the late stages of disease when the removal of waste products became insufficient so level of waste products and toxins started to increase in the blood, dialysis treatment become necessary and dietary restriction should be started 5. The diet of this patient is complex and difficult to manage and can cause different problems, restriction of many kinds food can lead to restricted routine diet and imbalance nutrition. Furthermore, loss of appetite

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is usually combined such patient and contributes to malnutrition. Social and other emotional factors such as inability to prepare meals and may cause malnutrition. Moreover limitation of every day foods it difficult for patient, effected their satisfaction 6.

MATERIALS AND METHOD


Setting and sampling: Hemodialysis center in Marjan Teaching Hospital and Imran Al-sadaq Hospital. Purposive sample of (50), patient were selected according to special criteria (Patient are not less than(30) years old, Patient who scheduled for hemodialysis not less than(6 month) before, Oriented, Free from disability(blindness, deafness or any mental illness), Free from hepatitis virus or immune deficiency syndrome, Agree to participate in the study), divided in two group (25) as control and other (25) for experimental.

Data collection: Data were collected by face to face individual interview the questionnaire need to completely filled about (15-20) minutes for each participant, (50) patients selected and dividable into two group, the first group treated as control group (25) pretest conducted to the patients according to their weekly appointment to hemodialysis, sessions, their posttest obtained squancelly after two weeks, the other (25) patient managed as experimental group, pretest obtained according to their attendance to the hemodialysis unit than they exposed to designed self-care educational program session. Small group teaching method performed according to the capacity of the unit and the number of the patients how scheduled to hemodialysis session related to the number of available machines. After two weeks later posttest obtained from (25) patient who attended session of the educational program which takes about ( 40) min extended for (3) days. Data collection started from the period from (7 April to 11 May 2018).

RESULTS AND DISCUSSION

The result of table (1) which presented the socio-demographical characteristics show that the high percentage of the participant in both groups were with 51 and more yrs. of age. While the gender in control group 14(56%) were female, 15(60%) of the experimental group were male and 20(80%) married in the control group in the experimental 25(100%) were married. the highest percentage of education level in control group 8(32%) were read and write and 8(32%) primary in the experimental group. The result agree with the finding of published study in 2013, which carried on hemodialysis patients who attended dialysis unit, which indicated that the majority of the study sample (54.7%) were male and the remaining were female, the highest percentage of them were (51-60) years old and accounted for (24.66%), In regards to the subject marital status, the majority of the sample were married and they consist of (67.3%) of the whole of the study sample. Relative of their educational status, the greater percentage of them were primary school graduates and they accounted for (24.7%) of the sample. Related to residency of the control group 13 (52%) were located in rural area, while the experimental group 13 (52%)were urban area resident, this result agree with survey study of young adults with end stage renal disease 8 which indicate that the majority of the study subjects were live in the capital 9. This study carried out in hemodialysis units which only located in Al-Hilla city, all patients who located in the city and rural area attend this units to obtain the dialysis therapy. Indicated that the high percentage 14(56%) were retired in the control group, the high percentage among the experimental group subjects were 7(28%) were retired and free business, this result go with a line to the study which carried out upon (161) patients who scheduled to regular hemodialysis which find that 123 (76%) of the sample were retired and 4(2.5%) employed (10), related to the occupational structure, the low level of employment may be related to age, demised and limited physical activities regarding disease process. Related to monthly income shows that the monthly income in both group (control and experimental) 19 (76%) and 14(56%) were not enough. The result disagree with a study carried out on hemodialysis patient at rehman medical instituted Peshawar which stated that the economically satisfied were found among of the study sample 11, because of continuous life-long therapy is expensive need medication mentainance, frequent follow up visits and most of the study sample were retired with limited monthly income. According to the outcome of table (2,3) which demonstrates the responses of control and experimental group related to nutritional and electrolytes domains recorded no significant changes in the pre and posttest for the control group subjects, while significant
changes shows among experimental group. Hemodialysis patients should regard their intake of minerals and make efforts to reduce Na, K and Ph. intake. Blumenkrantz, reported that hemodialysis patients usually must restrict their daily potassium intake to 50–75 MEq/day (2–3 g/day) and phosphorus intake needs to be restricted to 0.6–1.2 g/day. The reduction on Na, Ph. and K consumption after nutrition education program due to help patients to improve adherence to suitable diet and food items, these results agree with they reported that the diet restrictive planed nutritional regime go along with low salt, phosphorus, potassium and thirst. Management may improve self-care and progress health status, which may be effective to increase the patient’s quality of life. Clients with poor knowledge regarding low protein diet and the risk of providing a list of food which is rich in phosphorus and explain how to decrease phosphorus intake, moreover, they should receive information about medical treatment of hypophosphatemia, more specific they should be instructed about how to avoid to consuming processed food which is rich in Na, K and phosphorous. Increasing the knowledge and consciousness of hemodialysis patients must comprise a cornerstone of therapy and an integral part of nursing responsibilities. The present study results confirm the first hypothesis which stated that patients who received the designed self-care program had significant difference in the total knowledge mean score than patients in control group who did not receive the designed self-care program. The current study findings revealed that patients in both study and control groups had limited knowledge related to dietary and fluid regimen, fistula care and medication and exercise. This is in congruence with who reported that the majority of patients on hemodialysis had a limited level of knowledge about their condition in pre intervention period but after implementation of intervention program, the knowledge of the patients shows improvements. The finding of table (4) demonstrated the responses of control and study group related to self-care directed toward fluid management and thirst, no significant changes appears among control group subjects in their pre and post-test at \( p(0.522) \), while significant change in \( p (0.000) \) presented among the experimental group between pre and posttest after they receive educational session related to directing their self-care towered fluid and thirst management.

**Table 1. Distribution of study sample according to their socio-demographic variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameters</th>
<th>Control group=25</th>
<th>Experiment group=25</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
</tr>
<tr>
<td>Age</td>
<td>40yrs and less</td>
<td>6 24.0</td>
<td>4 16.0</td>
</tr>
<tr>
<td></td>
<td>41 -50 yrs.</td>
<td>9 36.0</td>
<td>7 28.0</td>
</tr>
<tr>
<td></td>
<td>51yrs and more</td>
<td>10 40.0</td>
<td>14 56.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25 100</td>
<td>25 100</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>11 44.0</td>
<td>15 60.0</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>14 56.0</td>
<td>10 40.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25 100</td>
<td>25 100</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Single</td>
<td>5 20.0</td>
<td>0 0.0</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>20 80.0</td>
<td>25 100.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25 100</td>
<td>15 100</td>
</tr>
<tr>
<td>Education level</td>
<td>Read and wright</td>
<td>8 32.0</td>
<td>2 8.0</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>7 28.0</td>
<td>8 32.0</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>4 16.0</td>
<td>6 24.0</td>
</tr>
<tr>
<td></td>
<td>Preparator</td>
<td>2 8.0</td>
<td>3 12.0</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>1 4.0</td>
<td>3 12.0</td>
</tr>
<tr>
<td></td>
<td>Institute</td>
<td>3 12.0</td>
<td>2 8.0</td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>0 0.0</td>
<td>1 4.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25 100</td>
<td>25 100</td>
</tr>
<tr>
<td>Residency</td>
<td>Urban</td>
<td>12 48.0</td>
<td>13 52.0</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>13 52.0</td>
<td>12 48.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25 100</td>
<td>25 100</td>
</tr>
</tbody>
</table>
Table 2. Response of (control – experimental) group related to protein.

<table>
<thead>
<tr>
<th>Question of protein</th>
<th>Control</th>
<th></th>
<th></th>
<th>Experimental</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>1. You plan your food depending up on food pyramid?</td>
<td>1.16±0.47</td>
<td>1.16±0.47</td>
<td></td>
<td>1.08±0.40</td>
<td>2.80±0.41</td>
<td></td>
</tr>
<tr>
<td>2. It is necessary to classify the food eaten according to the food pyramid to achieve healthy food?</td>
<td>1.20±0.58</td>
<td>1.20±0.58</td>
<td></td>
<td>1.08±0.40</td>
<td>2.68±0.48</td>
<td></td>
</tr>
<tr>
<td>3. Food is an important element in stabilizing health condition?</td>
<td>1.80±0.87</td>
<td>1.80±0.87</td>
<td></td>
<td>2.08±0.91</td>
<td>3.00±0.00</td>
<td></td>
</tr>
<tr>
<td>4. Hemodialysis is a process contributes to loss amounts of protein?</td>
<td>1.40±0.71</td>
<td>1.40±0.71</td>
<td>1.000 NS</td>
<td>1.36±0.76</td>
<td>2.80±0.50</td>
<td>0.000**</td>
</tr>
<tr>
<td>5. proteins consider as source of energy?</td>
<td>1.84±0.94</td>
<td>1.84±0.94</td>
<td></td>
<td>1.56±0.87</td>
<td>2.76±0.60</td>
<td></td>
</tr>
<tr>
<td>6. it’s necessary to pay attention to calculate the amount of proteins which consumed per day?</td>
<td>1.04±0.20</td>
<td>1.04±0.20</td>
<td></td>
<td>1.16±0.47</td>
<td>2.56±0.58</td>
<td></td>
</tr>
<tr>
<td>7. I am aware to calculate the amount of proteins which consumed from dairy product and eggs?</td>
<td>1.32±0.63</td>
<td>1.32±0.63</td>
<td></td>
<td>1.20±0.50</td>
<td>2.80±0.58</td>
<td></td>
</tr>
<tr>
<td>Overall Mean</td>
<td>1.39±0.63</td>
<td>1.39±0.63</td>
<td></td>
<td>1.36±0.38</td>
<td>2.77±0.34</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Response of (control – experimental) group related to electrolyte (sodium, potassium, phosphorus)

| Question of sodium                                                                 | Control       |                          |                          | Experimental   |                          |                          |
|-----------------------------------------------------------------------------------|---------------|--------------------------|--------------------------|----------------|--------------------------|                          |
|                                                                                   | Pretest       | Posttest                 |                          | Pretest        | Posttest                 |                          |
|                                                                                   | Mean±SD       | Mean±SD                  |                          | Mean±SD        | Mean±SD                  |                          |
|                                                                                   |               |                          |                          |                |                          |                          |
| 1. The amount of fluid collected in the body depends on the amount of salts which consumed per day? | 1.40±0.76     | 1.48±0.82                |                          | 1.08±0.40      | 2.80±0.50                |                          |
| 2. The function of the heart is affected by the amount of fluid and salts collected in the body? | 1.52±0.87     | 1.60±0.91                |                          | 1.36±0.76      | 2.80±0.41                | 0.000**                  |
| 3. Canned food contained large amounts of salts?                                  | 1.76±0.78     | 1.76±0.78                |                          | 1.44±0.82      | 2.96±0.20                |                          |
| 4. Before buying processed food read the label installed on the canoed ?           | 1.16±0.47     | 1.16±0.47                |                          | 1.20±0.58      | 2.48±0.82                |                          |
| Overall Mean                                                                      | 1.46±0.72     | 1.50±0.54                |                          | 1.27±0.49      | 2.76±0.37                |                          |
Table 3. Response of (control – experimental) group related to electrolyte (sodium, potassium, phosphorus)

<table>
<thead>
<tr>
<th>Question of potassium</th>
<th>Control</th>
<th>Experimental</th>
<th>P</th>
<th>Control</th>
<th>Experimental</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>1. Myocardial function is affected by the amount of potassium in the body?</td>
<td>1.36±0.64</td>
<td>1.36±0.64</td>
<td>1.000 NS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. It is necessary to eat the food staff containing potassium regularly?</td>
<td>1.32±0.56</td>
<td>1.32±0.56</td>
<td>1.000 NS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Mean</td>
<td>1.34±0.60</td>
<td>1.34±0.60</td>
<td>1.24±0.56</td>
<td>2.50±0.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Response of (control – experimental) group related to fluid.

<table>
<thead>
<tr>
<th>Question of fluid</th>
<th>Control</th>
<th>Experimental</th>
<th>P</th>
<th>Control</th>
<th>Experimental</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>1. Increase in drinking fluid will affect weight gain?</td>
<td>2.08±0.86</td>
<td>2.24±0.83</td>
<td>1.92±0.86</td>
<td>2.96±0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Control and monitoring the amount of fluid which consumed per day at vitally to maintain health status?</td>
<td>1.36±0.70</td>
<td>1.52±0.82</td>
<td>1.44±0.65</td>
<td>2.80±0.41</td>
<td>0.522 NS</td>
<td></td>
</tr>
<tr>
<td>3. You follow may methods which can reduce thirst and lit the amount of fluid consume per day?</td>
<td>1.28±0.61</td>
<td>1.28±0.61</td>
<td>1.08±0.28</td>
<td>2.56±0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Mean</td>
<td>1.57±0.73</td>
<td>1.68±0.62</td>
<td>1.48±0.52</td>
<td>2.77±0.37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

The results presented significant change in the responses related to self-care for experimental group who receive designed educational program while, no significant change in the responses of self-care among control group, that mean the education program was effective and its enhance self-care for patient who undergoing hemodialysis.

Financial Disclosure: There is no financial disclosure.
Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Warith al-박비야 University, Adult nursing Department. College of Nursing and all experiments were carried out in accordance with approved guidelines.

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Effect of Divergent Thinking Strategies on the Intermediate First Grade Students in the Achievement of Science Classes

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1Department of Higher Education, College of Basic Education, Babylon University, Iraq

ABSTRACT

This study aims at examining the effect of divergent thinking strategies on the intermediate first grade students in the achievement of science classes. In this study, the researcher uses the experimental approach and applies the following variables: age (in months), Daniels Intelligence Test, and previous information test, in order to obtain accurate results. The total number of students is 70, divided into an experimental group of 35 students taught based on the divergent thinking strategies, and a control group of 35 students, taught based on the conventional method. After preparing all required tools for the two groups, the researcher started to apply the experiment. In order to achieve the goal of the study, tools of the divergent thinking strategies test were used. After scoring responses of the students, data from both groups were obtained and statistically processed. The results of the test showed that the experimental group taught based on the divergent thinking strategies outperformed the control group taught in the conventional method.

Keywords: Divergent thinking strategies; intermediate first grade students; science classes; achievement.

INTRODUCTION

After reviewing the new science curriculum of the intermediate first grade developed by the Ministry of Education, which had made a series of changes to the curriculum in which it had focused on vertical thinking skills and activities, the researcher realized that the conventional method of teaching which is based on memorization and rote learning and lack of using the strategies and methods that reinvigorate the role of the teacher in the education process are major factors in the reduction of achievement of education in science classes, especially after the issuance of the Ministry to the new curriculum with the purpose of improving learner’s education. One of the main desired goals of education is to provide learners with a set of required scientific experiences in order for them to keep pace with modern knowledge and technologies. Among important goals of teaching science classes are to develop the capacity of learners to face problems and create creative attitudes to encourage their curiosities; increase learners’ ability to process and interpret information; improve their ability to review and evaluate different possible solutions; and apply scientific methods related to real life situations. There are several modern teaching methods and strategies that pay attention to the learners and deem them as the focus of the education process. The education process has been shifted from the dependence on the teacher to dependence on the learner’s themselves, with minimal contribution of the teacher as a director in the education process. Modern researches and studies on the brain have results in the so called cognitive neuroscience, which provide educational applications for neuroscience. The objective of divergent thinking strategies is to generate different ideas about a certain subject or topic in a short period of time. These strategies allow the student to look at familiar things in a new way that allow him to interact with them in a creative and unconventional way. They generate new ideas and open junctions between neurons of the cerebrum, resulting in expansion of the neural net, which in turn leads to expansion of learners’ thinking. The study is based on the hypothesis that there are no differences that are statistically significant at the 0.05 between average grades of the experimental group and the control group. The researcher defined the study
terminology by defining the divergent thinking strategies as a mode of thinking that exercising and training on it would lead to making new junctions among neurons, leading to building nerve tissue in the neural network. These strategies are: hypothetical thinking, reversal, application of different symbol systems, analogy, analysis of view of point, completion, and web analysis of relations. Achievement is to accomplish a series of educations examinations in a school or college and learning something in a successful, diligent and skilful way.

**Cerebral Hemispheres and Divergent Thinking:**

Brain theories, in general, and cerebral hemispheres theories, in particular, have proved that functions of the left and right sides of the brain are working together despite the fact that the right side is less used. Some scientists indicate that the left side of the brain controls analytical, mathematical, spoken, written and traditional craft activities, while the right side of the brain is responsible for such activities as imagination, expression and intuition.

**Divergent thinking and Intelligence:** Scientists have been divided into two groups about the relationship between divergent thinking and intelligence. The first team is represented by Spearman, Bert and Thorndike, and the second team is represented by Gilford, Taylor and Magnimar. Each team presented their study results about this relationship. The first team highlighted the role of intelligence as a key factor in the divergent thinking, while the second team stressed that intelligence is measured by tests related to numerical and spatial abilities and memory through right responses previously determined. The second team distinguished between the divergent thinking and intelligence by stating that they are different types of human mental activities which are different in content and results. Guilford studies found that there are creative abilities which are independent of the mental abilities measured by intelligence tests, and that creativity is attributed to the structure of the mind; especially after it has been determined that creative abilities are independent from mental abilities measured by intelligence tests. Guilford believes that the divergent thinking is a type of sophisticated cognitive activity, and that intelligence tests are only a part of human intelligence. According to his point of view, they are not replaceable. Depono distinguishes between intelligence and thinking; he states that intelligence is an innate characteristic that depends on genes or early surrounding environment, or both, while thinking is the speed of processing information in the brain.

**Stages of teaching according to divergent thinking strategies:**

These strategies can be summarized as follows:

Stage 1: This is the stage of preparedness before teaching; it includes preparation learners’ activities and introducing lesson objectives.

Stage 2: Introduction and preparations during the lesson; it includes a prelude to the teaching situation and using open questions.

Stage 3: Introducing the new way of teaching using the divergent thinking strategies, which include: hypothetical thinking, reversal, application of different symbol systems, analogy, analysis of view of point, completion, and web analysis of relations.

Stage 4: Connecting the new learning with the previous one. It starts with discussions, open dialogues, and continuation of ideas by connecting old with new ideas.

Stage 5: Emphasis on occurrence of learning by laboratory and paper tests to extract and present main divergent creative ideas.

Stage 6: Feedback stage: introducing points of strengths and weaknesses of the learner.

**METHODOLOGY**

It includes an overview of the study procedures, starting from the research methodology, experimental design, population of the study, study sample, equivalence of the study groups (experimental and control groups), preparation of study tools, implementation and statistical means.

**First: Selection of experimental design**

It is a working program to implement the experiment procedures and it is a chart of conditions and factors surrounding the experiment for the researcher to observe and select difference to reach reliable and accurate conclusions about the relationships between independent and subordinate variables. Since this research included one independent variable, i.e. divergent thinking.
strategies, and two subordinate variables, i.e. the achievement and self-organized learning, the researcher used the experimental design of partial control (one experimental group) of post-tests, and two equivalent groups, one of them experimental taught based on the divergent thinking strategies, and the other group is the control group taught in the conventional method Table 1.

Second: Selection of Study Population and Sample

Study population included all intermediate first grade students of schools associated to the Babil Education Directorate for the year 2017-2018. The researcher selected a sample in a random manner. Sections A and C were selected; section C represented the experimental group of (41) students, which was taught based on the divergent thinking strategies, and section A represented the control group of (39) students, taught based on the conventional method. So, the number of the study sample was (80) students. Based on school records, the researcher found that some students failed in the first grade in previous years in both groups; failed students (six students in the experimental group and four students in the control group) were excluded from the study. The reason of their exclusion was that they had previous knowledge of topics to be taught during the period of the experiment, which could have an effect on the subordinate variables. So the number of the sample was reduced to (70) students distributed between two sections: section A consists of (34) students and section C consists of 36. Students were left in classrooms to keep the order in the school.

Equivalent research groups: the researcher made the two groups, experimental and control, equivalent in terms of the following variables: Equivalent in age (in months): on 18 February, 2018, the researcher got data related to the students of both groups from the official school records. Their ages were calculated in months (Annex 5). The T value was calculated from the arithmetic mean, standard deviation and contrast of the two groups. The (T) value was 0.492, which is less than the tabulated T value of (2). The results showed that there were no statically significance differences at 0.05 and a degree of freedom of 68. This proves that the two groups were equivalent in age. Equivalence in Daniels’ Intelligence Test: to make equivalence in the level of intelligence, the researcher conducted a test on 19 February, 2018 for the students of both groups. After scoring of test papers (Annex 6) and extracting the arithmetic mean, standard deviation and contrast of the two groups, the (T) value was 0.102, which is less than the tabulated T value of (2).

Research Tool

Identifying the purpose of the test: The researcher developed an achievement test related to the study subject. The researcher followed the following steps to develop the test:

Identifying the test objective: The test aims at testing achievement of the students in both groups in the science subject (2017-2018).

Determining the number of items: The researcher developed 40 objective items within the range of the study subject and the behavioral purposes to be measured.

Development of the specification table (test map): The researcher developed the test map which included the second chapter of the science book of the intermediate first grade of 2017-2018. Number of items of the test was 40 items.

Selection of behavioral purposes: 174 purposed were selected based on test items from the cells of the specification table, representing the six behavioral levels: remembering, comprehension, application, analysis, synthesis, and evaluation.

Development of test items: The researcher developed an achievement test of 40 items and identified their number according to behavioral purposes in the light of five levels of Bloom’s taxonomy of cognitive domain: remembering, comprehension, application, analysis, and synthesis.

Test instructions: The researcher completed responses instructions and scoring instructions for the test and developed criteria for scoring of test items. The researcher developed a sheet of paper for model answers used during scoring.

Test validity: The researcher used two types of validity: content validity and external validity. The researcher also used the specification table in constructing test items in order to make sure that the items represents the content of the study subject and behavioral objectives.
Test exploratory application: It includes:

First exploratory application: The researcher applied the test on an exploratory sample of 38 students, not from the study sample, to make sure of how clear the test instructions were and how sufficient was the test time.

Second exploratory application: The researcher applied test another time on a similar sample consisted of 100 students to analyze test items statistically and coefficient of difficulty.

Test reliability: The researcher proved stability and reliability of the objective items in two ways:

Half-split method: This method depends on splitting the test into two equal parts; each part represents a separate sample. The first part represents the odd items and the second part represents the even items. A student gets a mark from each part. Corrections were made using Spearman Brown Coefficient of 85.0.

Kuder-Richardson 20 method: Stability or reliability of test was calculated for test items by using Kuder-Richardson 20 equation. The researcher found that the reliability value of the test was 0.90, which is a good value, meaning that the test was reliable.

Experiment procedures application:

The researcher started the experiment in the second term of the academic year (2017-2018) on Sunday 18 February, 2018 using a sample consisting of 70 students-35 students in the experimental group and 35 students in the control group. The experiment ended on 3 May, 2018.

The researcher gathered information related to age of students in both groups from the official records of the school on 18 February, 2018.

RESULTS AND DISCUSSION

An achievement test was developed for the two groups after finalized the curriculum of the study material. The results revealed outperformance of the experimental group over the control group. Table 1 shows the arithmetic mean of the experimental group marks (17,45) at a standard deviation of 5,25, and a contrast of 27,45, while the corresponding control group figures were: arithmetic mean was 40,74; standard deviation was 4,74 and the contrast was 21,18. The T value was 3,845, which is higher than the tabulated value, which is 2, at a degree of freedom of 68 and a significance level of 0.05. So, there are statistically significant differences at 0.05 between the mean grades of students of the experimental group taught the science subject using the divergent thinking strategies and students of the control group taught in the conventional method in the achievement test Table 3. This demonstrates that teaching by using divergent thinking strategies has a positive effect on understanding information and scientific facts and explaining phenomena due to branching of thinking and increased crossing in brain neurons.

Table 1. Research Experimental Design

<table>
<thead>
<tr>
<th>Group</th>
<th>equivalence</th>
<th>Independent variable</th>
<th>Subordinate variable</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>Age in months</td>
<td>Divergent thinking strategies</td>
<td>Achievement</td>
<td>Achievement test measurement</td>
</tr>
<tr>
<td></td>
<td>Daniels intelligence test</td>
<td></td>
<td>Learning</td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>Previous information test</td>
<td>Conventional method</td>
<td>Self-organized</td>
<td>Self-organized learning</td>
</tr>
</tbody>
</table>
Table 2. Equal sets of search variables (age, danlis test, previous information)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Sample size</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
<th>contrast</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in months</td>
<td>experimental</td>
<td>35</td>
<td>155.17</td>
<td>5.9</td>
<td>34.81</td>
<td>68</td>
<td>0.492</td>
<td>Not statistically significant</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>35</td>
<td>154.15</td>
<td>6.3</td>
<td>39.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daniels intelligence test</td>
<td>experimental</td>
<td>35</td>
<td>18.41</td>
<td>3.81</td>
<td>3.81</td>
<td></td>
<td>0.102</td>
<td></td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>35</td>
<td>18.26</td>
<td>3.90</td>
<td>15.21</td>
<td></td>
<td>0.168</td>
<td></td>
</tr>
<tr>
<td>Previous information test</td>
<td>experimental</td>
<td>35</td>
<td>11.05</td>
<td>2.59</td>
<td>6.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>35</td>
<td>10.6</td>
<td>2.54</td>
<td>6.45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. T test results of two independent samples of the two groups in the achievement test.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sample size</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
<th>contrast</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>experimental</td>
<td>35</td>
<td>45.17</td>
<td>5.25</td>
<td>27.45</td>
<td>68</td>
<td>3.845</td>
<td>Statistically significant</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
<td>40.47</td>
<td>4.47</td>
<td>21.18</td>
<td></td>
<td>2.000</td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSION**

After demonstrating the effect of divergent thinking strategies, the researcher reached to the conclusion that teaching by using divergent thinking strategies resulted in improving achievement of the intermediate first grade students in the science subject. The researcher suggested the following: conducting different studies using divergent thinking strategies in various education stages (preliminary, preparatory, and academic); conducting studies on using divergent thinking strategies in other subjects; conducting studies on balancing the use of divergent thinking strategies with other teaching strategies in the same variables; and conducting studies on using divergent thinking strategies with other subordinate variables such as creative thinking and lateral thinking.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Higher Education, College of Basic Education, Babylon University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Mantle of Expert Strategy in Achievement of Students

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ABSTRACT

The researcher used the method of the experimental researcher as a method for his research procedures, which includes an independent variable (the Mantle of expert strategy, the usual method), and a variable followed, And the researcher adopted experimental design with a partial control to adjust the search variable, and before starting to apply the experiment, the researcher rewarded between the two research groups for the purpose of obtaining accurate and objective results with the following variables: (age of time calculated in months, After the equivalence between the two research groups, the researcher prepared the implementation requirements of the goals, plans and tests of the two research groups. After completing the experiment, the researcher applied research tools to the two research groups. After correcting the answers, the obtained data for students of the experimental group and the control. The data were statistically treated by t-test of two independent samples. The results showed that the experimental group, which was studied according to the Mantle of expert strategy, exceeded the control group studied by the traditional method in the academic achievement variable.

Keywords: Mantle of the Expert Strategy, Achievement, fifth grade literary student, natural geography.

INTRODUCTION

The current era has witnessed a great development in all aspects of life. We reflect this development in the field of education and teaching methods. This is reflected in the need to train the teacher to acquire modern teaching skills. It facilitates the process of learning and teaching, and promotes the resurrection of the children as a guide and facilitator, inspired by modern, this type of program requires special planning according to the modern strategies that have proved effective in the learning environment1. In recent years, there have been several educational theories based on a number of methods and strategies used in teaching, such as constructivism, which calls for the learner to build his own knowledge through his direct interaction with the educational situation and with the new knowledge, and connect it with his previous knowledge in the light The teacher’s guidance, and the structural theory is a contemporary educational trend that has become increasingly popular in contemporary educational and teaching thought, because of the great impact it has on the same learner. Structuralism has shifted attention from external factors to internal factors, Me what is going on inside the mind of the learner, such as: previous his information, and Dafieth, and patterns of thought and all that makes learning based on a deep understanding of a meaning (Pollard, 2003: 37). The modern education concerned the learner, making it its material, and not only its role in transmitting knowledge, but also aimed at teaching individuals how to think and how to learn 2. Education is one of those aspects and it plays a major role in societies and nations. It is the foundation of its development, its development, its main viability, continuity and the wave of environmental challenges. It plays a major role in the lives of both developed and developing peoples. Its ability to face the challenges of civilization and thus become a great strategy for all the peoples of the world because in the peoples and progress and civilization depends on the quality of its members then the way in the quality of human beings and their number 2. Effect of Mantle of the Expert Strategy in the Achievement of Students of The Fifth Literary geography. The strategy of the mantle of the expert: from the teaching strategies that started

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from the thought of constructivism, where the strategy of the mantle of the expert one of these strategies as this strategy translated the ideas of construction in the field of teaching different materials together, and its creator is Dorothy Heathcote). You see that the learner under the strategy mantle of the expert makes him understanding of the strategy seeks to hold a case in social justice, so that the point is placed on a task, the teacher in the mantle of the expert organizes behavior and presents information and outside the mantle of expert assistant, the voice of the expert is useful, but today he is the assistant colleague, and the students inside the abaya represent and express their feelings so that he works to develop the observation from the head because they make a world and control and live in addition to all of them mature and bear the responsibilities of adults. Their social involvement, imagination and knowledge.

The strategy of the mantle of the expert consists of four elements: Responsible Team, Client, Commission and Mission.

METHODOLOGY

A detailed description of the sample of the study of the equalization of the experimental total and the control and its society and the learning material and the stages of their numbers using the strategy of the mantle of the expert and the instrument of measurement and procedures to ensure its validity and stability, in addition to the application of the study and statistical methods used to extract the results.

Experimental Design for Research

It includes one independent variable (strategy of Mantle of The Expert). And a dependent variable (Achievement) so the researcher used the experimental design, which includes (control group and experimental).

Research Community and Its sample

The current research dealt with the fifth grade students who represent in the secondary and preparatory schools the governmental day that stems from the general directorate of education in Najaf province for the academic year 2017-2018, the number of people is not less than the fifth grade, (B), the researcher chose class (A) to be the experimental group and class B to be the control group according to the method Random sampling, and the experimental group consisted of (32) TA (32) students studying according to the traditional method. 3 students were excluded from the experimental group (2) from the control group. They have previous experience in subjects to be studied during the experiment. They may affect the dependent variable (achievement in natural geography), and the accuracy of the results, and are statistically excluded as shown in table (1).

Research Requirements

Identification of scientific material

After the researcher reviewed the annual plans of the teacher of the article and the survey of the views of the school geography to determine the subject covered by the experience, the article was the last three classes Course II (IV, V, VI) to be taught to students of the fifth grade literary year (2017_2018).

Formulation of behavioral goals

The researcher formulated (100) observable and measurable behavioral goals covering the six levels of Bloom’s classification (knowledge, understanding, application, analysis, synthesis, and evaluation).

Preparation of study plans

The researcher prepared a set of teaching plans for the last three chapters of the natural geography book, 24 study plans according to the traditional method and 24 study plans according to the strategy (the mantle of the expert), and models were presented to a group of experts in geography, teaching methods, Educational and psychological

Research tool (Achievement test)

It is defined as a measuring tool that is organized according to an organized method to determine the level of students’ achievement in a given subject matter that was previously learned by answering a sample of the questions that represent the content of the subject (Al-Saadawi, 2007: 52). There are several steps to prepare the achievement test as follows:

Determining the purpose of the achievement test:
The purpose of the achievement test is the achievement of the fifth grade students (information, experiences and skills) in the natural geography of the fifth grade of the three chapters: biosphere, soil, environment) according to the objectives of the behavior that was formulated Of the scientific material.
**Determination of the objectives of the test:** After determining the purpose of the test, the objectives of the test are determined to determine the extent to which they were achieved and the researcher developed a set of behavioral goals.

**Preparation of the specification table:** The researcher prepared a table of specifications that included the topics studied in the chapters (4, 5 and 6) of the natural geography of the fifth grade in the light of the behavioral objectives of the six levels in the knowledge field of the classification of (Bloom) Number of questions with (50) paragraphs distributed on matrix cells.

**Formulation of the test paragraphs:** The test paragraphs that measure the six levels of the Bloom classification, which include (multi-choice, understanding, application) of the type of multiple choice (objective tests) and the researcher’s use of these tests, are formulated because they have overall comprehensiveness, objectivity, flexibility, Many of the learning outcomes, shortening the time and effort, cover a large part of the content of the subject matter and reduce the impact of the guesswork (Back, 1998: 115).

**Test Instructions:** The researcher puts instructions for the achievement test write the name of the student in the place assigned to them in paper answer fifty paragraphs without leaving any paragraph. The answer is by drawing a circle around the correct answer. Within a specified time period.

**Correcting the test answers:** The researcher has developed a key to correct the objective paragraphs. The researcher has assigned one score to the paragraph which is answered correctly and one to the paragraph whose answer is wrong. The paragraph that is abandoned or that has more than one answer is treated as the wrong paragraph for multiple choice paragraphs (10), followed by the highest score of the achievement test (50) and the lowest score (0).

**Authenticity of the test:** Authentic honesty is one of the types of authenticity of the tool, and is reached through a specialized judgment on the degree of measurement of the attribute and the test was obtained on the proportion of agreement (90%) by experts and specialists in educational and psychological sciences and teaching methods.

**The application of the exploratory test**

**Application of the test:** To ensure the clarity of the test paragraphs and instructions for the answer and the calculation of the time required to answer the test paragraphs in full, the researcher applied the test on a sample survey of (40) students, the purpose of knowing the ambiguities in the instructions or test paragraphs and investigate the researcher from all procedures in All the paragraphs were extracted and the answer time for students for the test (48) minutes was approximately enough.

**Statistical analysis of the test paragraphs:** The researcher conducted the pilot test for statistical analysis by extracting the coefficient of difficulty and strength of excellence, and the effectiveness of the wrong alternatives, on a sample of (100) students.

**The difficulty factor of the paragraphs:** The coefficient of difficulty was calculated and the value of (0.43_ 0.75) which are good coefficients in the achievement test.

**The coefficient of distinguishing the paragraphs of the test:** The coefficient of the distinction of paragraphs is the degree that determines the ability of the paragraphs to distinguish between the responses of students of the high level and the answers of students of low level and the value of the coefficient of excellence in the test between (0.33 _ 0.48) and thus the coefficient of excellence is good and appropriate.

**Statistical methods:** To achieve the results and validate the data, the T-Test was used for two independent samples to make the equivalence in some variables (the age of time calculated in months, the students’ achievement in the first course in the natural geography of the fifth grade,
RESULTS AND DISCUSSION

The students of the experimental group who studied according to the strategy of the mantle of the expert exceeded the students of the control group who studied according to the usual method in the achievement test, thus rejecting the first zero hypothesis and accepting the alternative null hypothesis. There is a statistically significant difference at the level of significance (0.05) between the average score of the experimental group students who study according to the strategy of the mantle of the expert and the average score of the students of the control group who study according to the normal method in the test of the collection of the natural geography of the fifth grade literary and this is consistent with the studies to confirm The experimental group studied according to the Mantle of the expert strategy exceeded the control group studied according to the usual method. As shown in Table (2). This shows that the strategy of the cloak of the expert had an impact on raising the level of student achievement in the natural geography. The magnitude of the effect on the achievement test (0.80) is significant and this explains the superiority of the experimental group to the control group.

Table 1. Distribution of Research Groups (Experimental and Control Groups) before and after exclusion.

<table>
<thead>
<tr>
<th>Group</th>
<th>Class</th>
<th>No. of student before Exclusion</th>
<th>Recruiting students</th>
<th>No. of student after Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>A</td>
<td>32</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Control</td>
<td>B</td>
<td>32</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>The sum</td>
<td></td>
<td>64</td>
<td>3</td>
<td>61</td>
</tr>
</tbody>
</table>

Table 2. T-test for Research Groups in Achievement Test

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Median</th>
<th>Deviation</th>
<th>Variance</th>
<th>Degree of freedom</th>
<th>T – test value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>31</td>
<td>41,55</td>
<td>6,52</td>
<td>42,51</td>
<td>59</td>
<td>3,085</td>
<td>Statistically significant</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>35,8</td>
<td>7,98</td>
<td>63,68</td>
<td></td>
<td>2,000</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

The results of the research and its results can be summarized as follows: The use of the strategy of the mantle of the expert has an impact on the increase in the achievement of students in the literary fifth grade in Natural geography.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effectiveness of an Education Program on Hemodialysis Patient’s toward Alleviate of Itching at Al-Hussein Teaching Hospital in Al-Nasiriyah City

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ABSTRACT

The study aims to determine the effectiveness of an education program on hemodialysis patient’s toward alleviate of itching and to find out the association between the effect of an education program and patient’s demographic characteristics of age, education level, and gender. A quasi-experimental study design one study group (pretest-posttest) carried out at hemodialysis unit in AL-Hussein hospital teaching in AL- Nasiriyah city to identify Effectiveness of an Education Health Program on patients’ Knowledge toward alleviate of itching. The present research started from the 10th of October 2017 to the 29th of May 2018. The sample (80) patients who are undergoing hemodialysis. The findings of the study indicated that patients have poor knowledge in pretest. But post evaluation revealed good level of knowledge among hemodialysis patients toward alleviation of itching. The program reflects effects on patients’ knowledge. There were no statistical significant association between patients’ knowledge and their demographic characteristics. Conclusion: There was no statistical significant association between patients’ knowledge and their demographic characteristics. The study demonstrated that there was poor patients’ knowledge at hemodialysis unit toward alleviation of itching before application program in pretest and good practices in posttest.

Keywords: Educational program, Patients’ Knowledge, Itching, Hemodialysis.

INTRODUCTION

Hemodialysis patients face many complications that affect health status, uremic pruritus (UP) is a common complication for hemodialysis patients with multifactorial etiology. Pruritus is significantly vary over time; and during the renal disease, patients are being affected to a variable degrees during this period. Uremic pruritus intensity, during day and night time, is ranging from intermittent discomfort to completely restlessness ¹. Uremic pruritus has significant effect on physical, social and psychological status for most of patients undergoing hemodialysis. Mechanical damage due to continuous scratching with movements, overlapping injuries and chronic skin lesions that cause chronic fatigue disorders, are associated with diurnal and nocturnal rhythm disorders and have a negative impact on mental and physical abilities. Uremic pruritus has influence on social relation and work productivity, and also, has effect on mood and cause depression and anxiety ². Pruritus in HD patients may lead to physiological problems, such as lesions on the skin, bleeding, chronic fatigue, and sleep disorders, and psychological problems, such as anger, anxiety–depression, and social isolation. These problems reduce patients’ quality of life and self-care ability and make compliance with the disease ³. It is reported in studies carried out with HD patients that patients have low quality of life, and sleep problems is one of the factors reducing quality of life, it is reported in some studies that the prevalence of sleep disorders is over 65% in HD patients. Sleep disturbances are described as difficulty in falling asleep, nocturnal awakenings, remaining awake at night, daytime sleepiness, and chronic fatigue. The relationship between itching, quality of life, and sleep problems indicates that it is important to evaluate these problems as a whole. It is
important to eliminate itching to improve quality of life and to reduce sleep problems in HD patients. The specific nerve pathways of pruritus remain unclear. In general, substances that cause pruritus include kinins, serotonin, proteases, neuropeptides, leukotrienes, and other chemicals. Uremic pruritus is caused by systemic metabolic problems. The factors leading to pruritus in dialysis patients can also include xeroderma, abnormal innervation, excessive phosphorus, calcium ions, allergic reactions to dialysis, overly high levels of C-reactive protein, and hyperparathyroidism. Indicated that 61% of uremic patients experience difficulty falling asleep because of pruritus, and 44% have their sleep disrupted by itchy sensations, in some cases leading to emotional anxiety and depression. Pruritus occurs more frequently at night, and the itchiness often influences patients’ sleep and moods. Approximately 20–50% of patients feel that pruritus negatively affects their lives. Clinical treatment for uremic pruritus begins with changing dialysis methods to reduce the production of pruritogens; however, changing the dialysis method has limited effectiveness in improving pruritus. Drug therapy is another common clinical treatment method. Antihistamines, capsaicin, opioids, and pramoxine can be administered intravenously, orally, or topically to treat pruritus. Unfortunately, despite these interventions, pruritus remains a long-term problem for many dialysis patients. Considering the liver and kidney burdens of dialysis patients, the advantages and disadvantages of long-term medication are worth considering. Common alternatives to drug treatment include the application of emollients, ultraviolet irradiation, and acupuncture, but the intervention methods and results have failed to reveal consistent findings. We therefore conducted a systematic literature review to provide a critical reference for clinical nurses assessing the needs of dialysis patients and to guide patients with pruritus. However, it seems that one of the main causes of this symptom is xeroderma due to insufficient removal of waste metabolites, sweating disorders (e.g., anhidrosis), sweat and sebaceous glands atrophy, increased level of vitamin A in epidermis, and fluid restriction. Given the various causes of pruritus, different treatments are recommended for relieving, including medications (such as oral gabapentin, high molecular weight sericin polymer) and photo and massage therapies, as well as omega-3 fatty acids. Nevertheless, choosing an effective and appropriate treatment with considering patients’ condition is still a challenge for the healthcare system due to various responses to different treatment modalities. Several patients cannot tolerate medicines due to the insufficient disposal of medicinal metabolites. Given the fact that 97% of the patients with pruritus suffer from xeroderma, it seems that administration of emollients with high moisturizing properties might be effective.

MATERIALS AND METHOD

Quasi experimental study was conducted on patients who undergoing hemodialysis from the 10th of October 2017 to the 29th of May 2018. The study was conducted at AL-Hussein teaching hospital. The sample of (80) patients. The data were collected through using specially constructed questionnaire, which comprises three parts. The first one is demographic characteristics and the second part of the questionnaire concerned medical sheet to hemodialysis patients, third part of the questionnaire concerned with patients knowledge toward alleviate itching. The questionnaire used pretest before application of the program and posttest immediately after the application of the program. Part I: Demographic Characteristics. The demographic characteristics for the patients include age, gender, level of education, address, social status, income, occupation. Part II: medical sheet to hemodialysis Part III: patients Knowledge toward alleviate itching. This part of the questionnaire consisted of (16) items. Therefore to estimate the patients’ knowledge are divided to three grades low, moderate and high. The validity of the questionnaire determine through a panel of (12) experts the reliability of the questionnaire will determine through a pilot study. The statistical analysis through the application of descriptive statistic frequency, percentage, and the application of inferential statistical procedures.

RESULTS AND DISCUSSION

The finding of the present study indicates the results of the study had shown that more than half of the study sample the majority of the study sample at the middle age ranged (40 - 49) years. And they are accounted for (24) patients with percent (29.3%). This result agree with Daffar, et al., (2013), that show the majority of study sample with mean age (42.4). This might because of prevalence of diabetes type 2 and long standing uncontrolled hypertension among these age group (researcher), this result supported by Alashek et al., (2012), who sated that diabetes and hypertensive
nephropathy were more common causes of end stage renal disease (ESRD). Relative to gender it is noticed that (67.5%) of the study sample are male and the remaining are female. This result is similar to study done by Mohamad et al., (2011), they reported that the study population consisted of (115) hemodialysis patients with vascular access device more than half (67%) of them were male and (33%) female. This high prevalence of end stage renal disease (ESRD) in males, this results is supported by Mahdi, (2013), who stated that the prevalence of chronic renal failure was significantly more than half of male in comparison with female. Concerning with educational levels, the greater number of them had low level of education, such as not read and write, read and write, and primary school graduate, such result is an ordinary outcome for our society because largest number of families under the line of poverty with insufficient monthly income. According to the subjects marital status, the majority of the sample are married (57) and they accounted for (71.2%) of the total sample. As we know that the affect of the persons marital status, but in light of the Iraq culture, the marital status after disease may still continuing because the strong of sociocultural band in southern area of Iraq. This result is similar to a study done by Khasal, (2013) who stated that the largest of hemodialysis patients proportion are married. Relative to occupation status, results indicated that a highest percentage of the study sample are (unemployed, no working, retired, and house wife). In regarding to monthly income, the majority of the study sample are within the insufficient monthly income,(No salary, accounted 65%) based on that and according to the diseases related cost of care statistics, individual as well, especially in our country as a developing one who that lives under the shadows of the global financial crisis. While in our country unfortunately there, is no available data regarding such important issue? We believe that the responsible official bodies in the Ministry of Health in our country need to be more committed and focused to such kind of data for its vital role in planning health policies scientifically (The researcher). This result agrees with study done by 7 who stated that monthly income is not enough. Relative to the history of the renal failure started, the results indicated that the highest percent (51%) hemodialysis patients had renal failure from 2-4 years. Relative to the number of hemodialysis per week, the results indicated that the majority of (50%) patients done hemodialysis three time per week. This result agrees with (National Kidney Foundation, 2016) reported that the, the hemodialysis is classically done 3 times per week for about 4 hours at each time. Persons who select to do hemodialysis at home might done dialysis treatment more commonly, 4-7 times per week for few hours each time. Concerning the family member have kidney failure ,The study result that the indicate the majority of the study sample haven’t family member of kidney failure (63.8%) this result disagree with study by freedman et.al (1997) that revealed the dialysis patient have family history. Related to itching appear, the results indicated that a highest percentage of the study sample are daily appear and they are accounted for 39 (77%) this result agree with study by Vandana S (2010) they reported that the study population consisted of (103) hemodialysis patient , was reported by 84% of patients that Itching daily or nearly daily. The majority of nature of itching of the study sample individuals are continuous and they are accounted (77%) this result agree with study by Maryam Akhyani et al (2005) who reported that the Uremic pruritus often might be constant in (50%) in the majority of those who were affected by exacerbation or intermittent conditions which were being with spontaneous remissions. Related to severity of itching, the results indicated that a highest percentage of the study sample are (sever) and they are accounted for (46.2%, this result disagree with study by). Maryam Akhyani et al . (2005) reported that about 41.9% of patients were experiencing pruritus: (severe 37.1%, moderate 11.4%, and mild 51.4%). The majority of patient’s responses for the study group at post program (pass) excepting paragraph (13) fail supported by. Supported by Chiu-Feng Wu et.al (2015) Around 50–90% of hemodialysis patients develop pruritus. Although studies examining non-pharmacological treatments for itchy skin have been conducted, this study aimed to understand non-pharmacological interventions carried out in clinical trials for uremic pruritus and to evaluate and consolidate the information regarding these improvements and their effectiveness.
Table 1. Distribution of the study sample according to overall evaluation for patient knowledge about itching hemodialysis

<table>
<thead>
<tr>
<th>Period of the study</th>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
<th>Mean of Score</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>Fail</td>
<td>77</td>
<td>96.2</td>
<td>1.04</td>
<td>Fail</td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>3</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post. Test</td>
<td>Fail</td>
<td>9</td>
<td>11.2</td>
<td>1.89</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>71</td>
<td>88.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Effectiveness of Educational Program toward Alleviation Itching on Study Group for Pre and Posttest by (t-test).

<table>
<thead>
<tr>
<th>Paired t test sample correlation</th>
<th>Period of the study</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t. test value</th>
<th>DF</th>
<th>P. value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-TEST</td>
<td>1.04</td>
<td>0.191</td>
<td></td>
<td>18.54</td>
<td>79</td>
<td>0.001</td>
<td>HS</td>
</tr>
<tr>
<td>POST –TEST</td>
<td>1.88</td>
<td>0.333</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 3. Association between Age and Effectiveness of Educational Program toward Alleviation Itching on Study Group for Posttest:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
<th>Overall evaluation</th>
<th>Chi. Sq value</th>
<th>D.F</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age / years</td>
<td>Fail</td>
<td>2</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>1</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>5</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>1</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>9</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Association between Gender and Effectiveness of Educational Program toward Alleviation Itching on Study Group for Posttest:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
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<th>Chi. Sq value</th>
<th>D.F</th>
<th>Significant</th>
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<tbody>
<tr>
<td>sex of patient</td>
<td>Fail</td>
<td>6</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>4</td>
<td>22</td>
<td>1</td>
<td>0.588 NS</td>
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<tr>
<td></td>
<td>Fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>9</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5. Association between Education Level and Effectiveness of Educational Program toward Alleviation Itching on Study Group for Posttest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
<th>Overall Evaluation</th>
<th>Chi. Sq Value</th>
<th>D.F</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fail</td>
<td>Pass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>2</td>
<td>17</td>
<td></td>
<td>0.929a</td>
<td>6</td>
</tr>
<tr>
<td>Read And Write</td>
<td>2</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>3</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School</td>
<td>2</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>1</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor And Above</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSION**

There is no statistical significant association between patients’ knowledge and their demographic characteristics (age, gender, level of education). The study demonstrated that there was poor patients’ knowledge at hemodialysis unite toward alleviate itching before application of program in pretest and good knowledge in posttest and An intensive comprehensive large population-based (national level) studies could be conducted to improve patient’s knowledge toward Alleviation Itching of hemodialysis patients, Educational program needs to be done for patients who suffer from end stage renal kidney disease throughout the pre-dialysis and continued after kidney maintenance with their caregivers to improve their knowledge and skills about the disease and its treatment.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Adult Nursing Department, College of Nursing, University of Baghdad, Baghdad/Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

Effectiveness of an Education Program on Hemodialysis Patients' Knowledge towards Dietary Regimen at Al- Hussein Teaching Hospital in Al- Nasiriyha City

Fatima J. Shinjar¹, Serwan J. Bakey¹, Khalida M Khudur¹
Adult Nursing Department, College of Nursing, University of Thiqar, Iraq.

ABSTRACT

Nutritional health is one of the most important considerations in patients with chronic kidney disease especially in those undergoing maintenance hemodialysis. Advanced kidney disease and renal replacement therapy lead to several metabolic and nutritional derangements, which can be termed as protein-energy wasting of chronic kidney disease. Despite the importance of nutrition in hemodialysis patients, studies have shown insufficient awareness about proper nutrition in these patients. Studies also found positive clinical results and knowledge of nutrition education in hemodialysis patients. A quasi experimental study design is carried out at AL-Hussein Teaching Hospital in AL-Nasiriyah City, from 4th December, 2017 to 9th of July, 2018. A non-probability (Purposive sample) of (80) patients on maintenance hemodialysis patients divided into two group: (40) patients as control group and (40) patients as study group. The data were collected through the use of questionnaire designed by researcher, which consists of three parts (1) sociodemographic data form (2) medical sheet information, and (3) main domains of an education program, by direct interview technique with the patients. Reliability of the questionnaire is determined through a pilot study and the validity through a panel of experts. The data are analyzed through the use of Statistical Package for Social Science (IBM-SPSS version 24).

Keywords: Effectiveness, Education Program, Patients Knowledge, Dietary Regimen.

INTRODUCTION

Chronic renal failure is one of the major public health problems. Its incidence is increasing because of rising diseases like diabetes mellitus, hypertension and malignancies. It is defined as a progressive, unpredictable and frequently irreversible decline in kidney function. The patients may not feel sick as it progresses to end stage renal disease (ESRD), that occurs when the majority of normal kidney functions are lost (Glomerular Filtration Rate (GFR)<15%). At this stage, dialysis or a kidney transplant is required to survive. The patients undergo a complex treatment regimen, which often involves dialysis and a wide range of dietary restrictions¹ ² ³. Nutritional health is one of the most important considerations in patients with chronic kidney disease especially in those undergoing maintenance hemodialysis (MHD). Advanced kidney disease and renal replacement therapy lead to several metabolic and nutritional derangements, which can be termed as protein-energy wasting (PEW) of chronic kidney disease (CKD). PEW is associated with major adverse clinical outcomes and is a significant co-morbid condition leading to increased rates of hospitalization and death in patients undergoing MHD 4. A protein-energy wasting affects 20–70 percent of patients with dialysis and elevated with dialysis treatment duration⁴. Various studies presented that awareness of patients with ESRD about proper nutrition is insufficient. If patients are educated about the outcomes of neglecting dietary and fluid restrictions and if they confirm those consequences to be threatening their life, they are more likely to be concerned about their health ⁶ ⁷. Nurses are in the forefront in patient education, support, screening

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and information reinforcement. Nurses are involved in evaluating the efficacy of the treatment and reinforcing all prescriptions including the dietary prescription. Among hemodialysis experts, nurses play a special role and due to a close contact with the patients, they are more aware of patients’ concerns and can provide suitable suggestions and recommendations. Moreover, education is an efficient method and is among independent and expected roles from nurses and they help the patients about their self-care.6, 8

**MATERIAL AND METHOD**

A quantitative quasi-experimental study has been applied in Nasiriyah City at AL-Hussein Teaching Hospital (dialysis unit) with the use of pre-post-test approach for two groups of samples (study and control) during the period 4th December, 2017 to 9th of July, 2018. A non-probability (purposive) sample of (80) patients on maintenance hemodialysis, who were attending the hemodialysis unit at AL-Hussein Teaching hospital, were selected to achieve the objectives of the study. The sample was divided randomly into two groups: (40) Patients did not expose to the program was considered as the study group. A non-probability (purposive) sample of (80) patients on maintenance hemodialysis, who were attending the hemodialysis unit at AL-Hussein Teaching hospital, were selected to achieve the objectives of the study. The sample was divided randomly into two groups: (40) Patients did not expose to the program was considered as the study group. The sample was divided randomly into two groups: (40) Patients did not expose to the program was considered as the study group. and other (40) Patients who were participated to the program, considered as the “study group”. To accomplish the study, the researcher constructed the questionnaire based on the review of previous related literature and related studies. The study instrument comprised of (3) parts: Part I: Socio-Demographic Data: It consists of (7) items such as (age, gender, education level, mitral status, occupation, monthly income for family and local of the house own) Part II: Medical Sheet Information such as (when a chronic kidney failure started, duration of hemodialysis, how many hemodialysis sessions per week) Part III: Patients’ Knowledge Toward Dietary Regimen: It was composed of (41) Items that include: knowledge about benefit of following proper dietary regimen, proteins, calories, potassium, phosphorus and calcium, sodium, fluids and vitamins and dietary supplements. The items were know, not sure and do not know questions. These rated as (3) for now answer (2) for not sure answer and (1) for do not know. The time of questionnaire answer list, for each patient took about (30 - 45) minutes. The reliability was determined through the use of test and re-test approach on 10 hemodialysis patients revealed that the person correlation coefficient is (r= 84). The educational program was carried out as individual's education during hemodialysis sessions and as groups in the continuous nursing education hall of first floor in AL- Hussein Teaching Hospital as four sessions given in four weeks, each session lasted 30-45 minute. One month after the completion of the educational program, patients were reassessed using study tool. Data were analyzed through the use of SPSS application version 24.0. Descriptive data analysis including Frequency, Percentage, Mean of score (M.S) with their Standard Deviation (S.D). Inferential data analysis includes Pearson Correlation Coefficient, t-test, ANOVA.

**RESULTS AND DISCUSSION**

Table 1 displays the frequency counts for selected variables. As mentioned above, the two groups (control versus study) are equal in size (40 participants for each of them). This table indicates that most hemodialysis patients are within age group of (48 – above years), study group (n= 21; 52.5%) and control group (n= 22; 55%). Most of the participants in both groups according to their gender are males (n= 28; 70%) in the study group and the number in the control group is (n= 27; 67.5%). With respect to the marital status, the majority of the participants in the study group are married (n= 33; 82.5%), and almost the same proportion of the married participants in the control group (n= 32; 80%). Regarding the level of education, the greater number of both study and control groups and they are accounted for (n= 13; 32.5%) for study group and (n= 14; 35%) for study group. Related to occupation status, the results indicated that the highest percentage of the both study groups are (unemployed: no working, retried) and they are accounted for ((n= 62; 65.1%). The majority of monthly income of the study group individuals are parley sufficient (n= 21; 52%), while the majority of monthly income of the control group individuals are insufficient (n= 20; 50%). Regarding the living environment, the majority of both study and control groups participants are living in rural areas (n= 22; 55%), (n= 25; 65%) respectively. Table 2 indicated that the majority of hemodialysis patients have history of renal failure from 1 – 5 years which accounted (n= 23; 57.5%) for study group and (n= 29; 72.5%) for control group, while (n= 12; 30%) for study group and (n= 10; 25%) for control group have renal failure for less than one year. Most participants started hemodialysis treatment from 1 – 2 years which account for (34; 42.5%) for the entire sample and (26; 32.5%) of the all study sample started hemodialysis treatment less than one year. Related to the number of hemodialysis sessions per week, the results indicated that the majority
of the study group have done three hemodialysis sessions per week (n= 24; 60%), while the majority of the control group have done twice hemodialysis sessions per week (n= 26; 65%). A highly significant difference between pre and posttests in the study group related to all items of the study, (Table 3) while there is a slight significant difference between pre and posttests in the control group related to all items of the study. Table 4 shows significant correlation between the level of education and hemodialysis patients’ knowledge toward dietary regimen in pretest. While, there is no correlation between the level of education and hemodialysis patients' knowledge toward dietary regimen in posttest. The findings of data analysis that are shown in table (1) indicated that more than half of the sample aged from 48 and above years old. Which accounted for (43) of study participants with percent (53.8%). This result supported by a study carried out at 2015 that show the heights of study sample were at age group (48-57) years. Also supported by a study that concluded the majority of study sample with mean age 26-78 61±14 year. The researcher believes that the reasons of this result are aging and prevalence of diabetes mellitus type 2 as well as chronic poor controlled hypertension among these age group, this result also supported by a study concluded that diabetes and hypertensive nephropathy were most common causes of ESRD in patients mean age (49) years. Relative to gender the results indicated that (68.8%) of the study sample are male and which accounted for (55) while the remaining are female. In comparing with other studies, a study conducted at Tikrit Teaching Hospital where found the male accounted for 69 of 116 participants. Additional support was found by Kang that found more than half of them sample were male (77; 53%). According to the participants’ marital status, the majority of them are married (65) accounted for (81.3%) of the total sample. This result is similar to a study done in Holy Kerbala who stated that the largest proportion of hemodialysis patients are married (40; 80%) . As well as supportive evidence for these findings have been found in a study carried out at (2014) which reported that 64; 52.5% of them subjects are married. This finding revealed that the researcher was delivered the information related to the dietary regimen to all participants in a manner commensurate with their different educational background.

### Table 1. Distribution of the Study Sample by Socio-Demographic for (Study and Control Group) (N= 80 Patients)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Total group</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 18 – 27 yrs.</td>
<td>11</td>
<td>13.8</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>From 28- 37 yrs.</td>
<td>6</td>
<td>7.5</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>From 38 – 47 yrs.</td>
<td>20</td>
<td>25.0</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>From48– above</td>
<td>43</td>
<td>53.8</td>
<td>21</td>
<td>52.5</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55</td>
<td>68.8</td>
<td>28</td>
<td>70.0</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>31.3</td>
<td>12</td>
<td>30.0</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>65</td>
<td>81.3</td>
<td>33</td>
<td>82.5</td>
</tr>
<tr>
<td>Single</td>
<td>8</td>
<td>10.0</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Widow</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>2.5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Separate</td>
<td>1</td>
<td>1.3</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>
### Table 1. Distribution of the Study Sample by Socio-Demographic for (Study and Control Group) (N=80 Patients)

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Total group</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not read and write</td>
<td>27</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Read and write</td>
<td>16</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Primary</td>
<td>19</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Intermediate</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Secondary</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Institute and colleague graduation or higher</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

### Table 2. Distribution of the (80) Hemodialysis Patients According to the Medical Sheet Information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Total group</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>freq.</td>
<td>%</td>
</tr>
<tr>
<td>When the renal failure started</td>
<td>Less than one year</td>
<td>22</td>
<td>27.5</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>From 1-5 yrs.</td>
<td>52</td>
<td>65</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>From 6-10 yrs.</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>From 11-15 yrs.</td>
<td>2</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>When hemodialysis started</td>
<td>Less than one year</td>
<td>26</td>
<td>32.5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>From 1-2 year</td>
<td>34</td>
<td>42.5</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>From 2-3 year</td>
<td>13</td>
<td>16.3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>From 3-4 year</td>
<td>3</td>
<td>3.8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>More than 4 year</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>Number of Hemodialysis sessions /Week</td>
<td>Twice hemodialysis sessions/week</td>
<td>42</td>
<td>52.5</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Three hemodialysis sessions /week</td>
<td>38</td>
<td>47.5</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>100</td>
<td>40</td>
</tr>
</tbody>
</table>

### Table 3. The comparison significance between the two periods (pre and post-tests) related patients’ knowledge of the study and control groups.

<table>
<thead>
<tr>
<th>Main domain</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>knowledge related to the benefit of following proper dietary regimen</td>
<td>1.10 .304</td>
<td>2.68 .474</td>
</tr>
<tr>
<td>knowledge related to proteins</td>
<td>1.23 .423</td>
<td>2.68 .526</td>
</tr>
<tr>
<td>knowledge related to calorie</td>
<td>1.60 .496</td>
<td>2.60 .496</td>
</tr>
<tr>
<td>knowledge related to potassium</td>
<td>1.08 .267</td>
<td>2.85 .362</td>
</tr>
<tr>
<td>knowledge related to phosphorous and calcium</td>
<td>1.00 .000</td>
<td>2.15 .362</td>
</tr>
<tr>
<td>knowledge related to sodium</td>
<td>1.30 .464</td>
<td>2.70 .464</td>
</tr>
<tr>
<td>knowledge related to fluids</td>
<td>1.28 .452</td>
<td>2.83 .385</td>
</tr>
<tr>
<td>knowledge related to vitamins and dietary supplements</td>
<td>1.28 .452</td>
<td>2.83 .362</td>
</tr>
<tr>
<td>Overall domain</td>
<td>1.15 .362</td>
<td>2.85 .362</td>
</tr>
</tbody>
</table>
Table 4. The Correlation between socio-demographic variables with Patients’ Knowledge toward dietary regimen for Study Group (Pre and Posttest) by ANOVA

<table>
<thead>
<tr>
<th>Socio-demographic variables</th>
<th>Study group (N=40)</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sum of squares</td>
<td>D.F.</td>
</tr>
<tr>
<td>Age</td>
<td>.390</td>
<td>3</td>
</tr>
<tr>
<td>Gender</td>
<td>.005</td>
<td>1</td>
</tr>
<tr>
<td>Level of education</td>
<td>2.977</td>
<td>5</td>
</tr>
<tr>
<td>Marital status</td>
<td>.191</td>
<td>4</td>
</tr>
<tr>
<td>Occupation</td>
<td>.464</td>
<td>4</td>
</tr>
<tr>
<td>Monthly income</td>
<td>.183</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sum of squares</td>
<td>D.F.</td>
</tr>
<tr>
<td>Age</td>
<td>.490</td>
<td>3</td>
</tr>
<tr>
<td>Gender</td>
<td>.076</td>
<td>1</td>
</tr>
<tr>
<td>Level of education</td>
<td>.464</td>
<td>5</td>
</tr>
<tr>
<td>Marital status</td>
<td>.858</td>
<td>4</td>
</tr>
<tr>
<td>Occupation</td>
<td>.341</td>
<td>4</td>
</tr>
<tr>
<td>Monthly income</td>
<td>.374</td>
<td>2</td>
</tr>
</tbody>
</table>

CONCLUSIONS

Most of the study sample were presented with lack of knowledge regarding dietary regimen that should be followed by chronic kidney diseases patients. Knowledge of the patients regarding dietary regimen has been improved after the implementation of the educational program in the study group as presented in the post test results in all domains. Statistically significant differences regarding knowledge about dietary regimen for patients on maintenance hemodialysis were found between study group and control group after implementation of the educational program. There was a significant relationship between the patients’ educational level and their knowledge toward dietary regimen for study group in pre-test; while, no significant relationship was presented between these two variables in post-test approach. This revealed the effectiveness of the applied educational program toward dietary regimen on patients’ knowledge with chronic kidney diseases.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Adult Nursing Department, College of Nursing, University of Thi-qar, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

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Harvest Strategy’s Effect on Students’ Achievement in Physics

Majd Momtaz abd Omran¹, Arif Hatem J ¹, Mohammad Hadi Shinen¹

¹ College of Basic Education, University of Babylon, Hillah City, Iraq

ABSTRACT

The aim of the research is to identify the impact of the harvest strategy on the achievement of students in the fourth grade of physics. In order to verify the objective, the researcher put the zero hypothesis, which states: There is no significant difference at the level of significance (0.05) The grades of the students of the control group who will study according to the usual method in the test of physics. The study sample consisted of (70) fourth grade students in the university’s junior high school. They were randomized to two groups (35) in each group. The two groups were rewarded with the following variables: age, IQ test, semester grade for physics. In the light of the relative importance of content and behavioral purposes, an achievement test consisting of (40) multiple choice types was constructed. The researcher investigated the characteristics of the cymometric test. The experiment lasted 8 weeks. At the end of the experiment, the results were then analyzed and showed that the students of the experimental group who studied according to the harvest strategy were superior to the control group who studied the normal way in the achievement variable.

Keywords: Strategy harvest, student’s fourth grade, physics, Collection

INTRODUCTION

Physics science is designed to help the human understand the natural phenomena surrounding, and increased its ability to the subject of measure and appreciation, and then the ability of the human on the use of them, a part of the basis of our culture of public, and will continue to inspire people, and will continue to strengthen the science and technology are all. To it with the boom scientific in the field of physics, which began with the beginning of the dawn of the twentieth century. Has become evident that in order to understand the learner of science and other basic, Must be accommodate a lot of the concepts of physical and falling in the basis of composition of the rest of science and link physics daily life learner, or in other words increase of culture and physical learner statement of the role of physics in the growth of civilization in general, as the physics its applications and its implications in society. Almost agree most specialists at the science physics a substrates natural Sciences which is the basis of a lot of science and other interested in a study analysis and interpretation of investment of natural phenomena, Physics and its effect of a large natural phenomena, Physics and its effect of a large scientific and technological progress on scientific and technological progress, the fact that matter physics include the concepts of abstract laws. And that the strategy of harvest is of strategies for creativity hard, the view this strategy that some people in the course creative thinking go out the results of a small, because it is at the end of the session creative thinking usually taken only ideas specific which looks process and the value of the meaning, but the only part of the results real creativity, and in the time himself we can become more skill and note new ideas, and concepts new that appear when starting with harvest be important to have ideas clear of what has been training him at the creative, strategy harvest is the method based and deliberate we are trying to collect outputs creative which emerged during the session creative; so that we can rated voltage creative to categories variety, used lists harvest as a guide to to categories variety, used lists harvest as a guide to rated voltage creative, and items that are used in the strategy of harvesting the following:

Specific ideas: this window ideas that looks valuable and practical and useful, that’s probably is looking for in
thinking creative hard 3.

beginnings of ideas: across this window see Vanguards or the beginnings of ideas, whether a good or bad, as the ideas rare usage is the ideas of unwanted, such as ideas is that are for use, but sometimes look like an exciting, or unusual, or value, and we Lyndon these ideas 4.

approaches: oriented is a way to a wide to consider the problem or the site, it can called as base of ideas, or administration, and in the end, you should work list of different aspects proposed or used, to deal with these ideas necessary to extract when cited directly to not get lost 5.

changes: the change of the notes worthy of interest, this change may be in the direction or in the interest, this change may be in the direction or in the concepts, may be the change in how to review of things, and sometimes happens change suddenly, and in the cases other happens gradually, so that the people involved are not aware of how to change the huge happen 6.

Flavor: adjective special session thinking creative back in general to the core of the ideas, in some session’s predominantly clearly adjective special (flavor of) for creativity, stems value special ideas of observation that help to acquire the status of the other to think about creative 7.

The steps to the application of strategy harvest in row:

Listening to ideas presented by others.

Identify the ideas writing that possible through makers and groups.

rating ideas to:

negative ideas
positive ideas
good ideas
unusable ideas
exciting ideas
an exciting ideas

METHODOLOGY

Include an offer of actions that has to achieve the goals of the search from the curriculum find and design demo and research community and its sample, and equal my search (experimental and controlled), and items search tools, and procedures for the application of experience and view the means of statistical used, will be viewed as follows:

Experimental Construct of the Research

Includes the changing the independent (strategy harvest and the way the normal), and variable continued (collection), so use the researcher design continued (collection), so use the researcher design demo the partial settings for two equal groups one experimental and one officer.

Population and Sample of the Research

Represents the research community current students and fourth grade science all of them in the schools (high school and secondary) day of government of the Directorate general education in the province of Babylon (Center) for the academic year (2017 – 2018 ad), which at least the number of people of the fourth grade science and for two divisions, the same find it has opted researcher (preparatory University) in the Center of the province of Babylon and intentional to make his research, found that it includes four people of the class fourth scientific (a, to, A., Dr.), choose the researcher division (a) a way that drag-random (how to draw) to represent the experimental group and number of students (35), a student who will examine its students on according to (a strategy harvest), the same way chose the researcher at random division (a) to represent the control group and number of students (35), a student who will examine its students on according to (the way the normal

Preparation of Research Requirements

The requirements of the search of the things basic underlying find that the on the basis is the implementation of measures search which this supplies in: (art. Scientific (content): were selected art. Scientific by the researcher teaching students my search within an experiment (second semester) of the academic year (2017 - 2018), M., included article scientific Applications of Polyethyl Methaacrylate in Medicine, as prepared a researcher 16 plan for the group’s experimental taught to according to
(a strategy harvest) ideals the group’s control taught to according to (the way the normal) Materials included Applications:

Poly (methyl methacrylate) [PMMA] “The Walter Wright”, introduced this as superior material for denture in 1937. The new material such as polystyrene and light activated methacrylate were introduced PMMA is the polymer of methyl methacrylate chemical formula (C5H8O2)n is clear and colorless polymer. Acrylonitrile (90-94%) combined with at least one or two monomers. In dentistry, for example, polymer plays vital role in denture. Development was made from decades to decades still ideal denture has not been made in dentistry. But the PMMA poly (methyl methacrylate)] is still a superior choice of prosthetics and less expensive and usage was found to have good durability.

Poly(Methyl Methacrylate) PMMA is an acrylic polymer, synthetic, self or thermally polymerized, which is clinically acceptable (especially in dentistry) for their properties: natural appearance, durability, low absorption and insolubility in oral fluids, absence of taste and odor and satisfactory thermal properties.

The powder of PMMA is one of the principal ingredients for the in-situ fabrication of bone cement. It is used as a spacer, i.e. to fill bone cavities and for general fixation of endoprosthetic (orthopaedic surgery). However, it is known that residual compounds from monomer polymerization can cause allergies and biological complications (stomatitis, Cheilitis, irritability), without considering the side effects for the patient, which are evident beginning in the early years (5 years after the implant is placed) and even after 30 years of use.

**Article of the Research:**

Determine the purpose of the test achievement: end envisaged of the achievement Test is to measure the collection of students fourth grade science (information skills and experience) in the substance of physics in the study of electrical characteristics dc of physics in Applications of Polyethyl Methacrylate in Medicine.

**Identify test objectives:** after that were selected the purpose of the achievement test is determined the objectives of the test to see how achieved the researcher the formulation of a number of goals behavioral.

**Determine the test items:** the researcher determine the number of paragraphs, which consists of the achievement Test because of the number of paragraphs of the test (40paragraph).

**Directed by paragraphs of the test:** the formulation of paragraphs of the achievement Test as the primary in light of the contents of the map test, chose the researcher type the test (multiple choice) which is of the best tests of substance, consisted of the test of (40) a paragraph test, distributed on levels Bloom cognitive (knowledge, understanding, application, analysis, installation, calendar), and on the Theme Applications of Polyethyl Methaacrylate in Medicine of the book of physics.

**Correcting the test answers:** the formulation the instructions and directions for how to answer is represented by (choose an alternative to correct one paragraph, the answer to paragraphs are all, the period of time to answer, writing name triple and grade division in space).

**Correct answers to the test:** after it has formulate paragraphs of the test and select the type of the test, has been set the standard for correct answers, the set (degree one for each paragraph test correct) and (zero to answer mistaken, and paragraph abandoned who did not have the student, paragraph who put her more than selection) thus top final class Supreme achievement Test is (40 °) the degree to the world (zero).

**The validity of the test:** is sure to honesty, the virtual test and sincerity of the content, as shown results that honesty virtual got the proportion of agreement (80%) by the arbitrators specialists, either sincerity of the content has appeared results that all paragraphs of the achievement Test function statistically, so is the achievement Test honest in measuring the understanding of absorption of students fourth grade science in the substance of physics.

**RESULTS AND DISCUSSION**

Two groups after the end of educational material which the researcher teaching it as shown results outweigh the experimental group on the control group according to the Table 2. Notice of table previous outweigh the experimental group on the control group in the achievement Test so there is a difference a statistically significant at the level of significance of the average scores students experiment, which are studying
the article physics on according to a strategy harvest and the average scores students of the control group, which are studying the article the same way the usual to achieve in achievement in favor of the experimental group Table 3. This is consistent with previous studies which confirmed outweigh the experimental group studied on according to a strategy harvest the control group studied on according to the way the normal, also use the researcher (kolmogorov-Smirnov test) distribution of natural which is of tests Non-scientific distribution of natural, judge it through the value of p if the value p probability is greater than the level of significance p probability is greater than the level of significance approved this means that there is no difference between the distribution function the synthesis sample and the distribution function theoretical moderate distribution, what is meant to accept the hypothesis scratch, ie the distribution of moderate, we note values p probability is greater than the level of significance adopted by the researcher, a (0.05) in the variable academic achievement the group’s experimental and controlled thus the members of the two groups are all follow the normal distribution in two variable in the search find that’s what achieves condition use of statistics Non-scientific him test t) est analysis of variance and table Table 4. It is stated previously confirms outweigh the students experiment studied according to a strategy harvest the students of the control group who studied in accordance with the way standard.

Table 1. The arithmetic mean, the standard deviation, and the two values of the variable of the chronological are calculated in months, First semester grades, IQ test) for the two research groups.

<table>
<thead>
<tr>
<th>variable</th>
<th>the group</th>
<th>Sample size</th>
<th>SMA</th>
<th>standard deviation</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age calculated in months</td>
<td>Experimental</td>
<td>35</td>
<td>171.468</td>
<td>12.258</td>
<td></td>
<td>0.997</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
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<td>35</td>
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<td>35</td>
<td>29.143</td>
<td>7.277</td>
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</tr>
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</table>

Table 2. Shows the superiority of the students in the experimental group to the students of the control group in the academic achievement.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>The group</th>
<th>Sample size</th>
<th>SMA</th>
<th>standard deviation</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
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<td>35</td>
<td>26.02</td>
<td>6.29</td>
<td></td>
<td>68</td>
<td>2.157</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
<td>22.65</td>
<td>6.77</td>
<td></td>
<td></td>
<td></td>
<td>Not functional</td>
</tr>
</tbody>
</table>

Table 3. Students’ grades for the final achievement test.

<table>
<thead>
<tr>
<th>Students’ grades for the final achievement test</th>
<th>Sample size</th>
<th>Highest grade</th>
<th>Less score</th>
<th>SMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>The group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>35</td>
<td>37</td>
<td>15</td>
<td>26.02</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
<td>35</td>
<td>8</td>
<td>22.65</td>
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Table 4. Test Shapiro-Wilk and test Kolmogorov-Smirnov For the two groups of research.

<table>
<thead>
<tr>
<th>Shapiro-Wilk test</th>
<th>Kolmogorov-Smirnov test</th>
<th>The group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of significance</td>
<td>Probability p</td>
<td>Statistics</td>
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<td>Not functional</td>
<td>0.319</td>
<td>0.965</td>
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<tr>
<td></td>
<td>0.753</td>
<td>0.980</td>
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</table>

**CONCLUSION**

The harvest strategy has a significant positive impact in increasing the achievement of students in the fourth grade in physics and increasing their ability to understand information, facts and knowledge and raise their level of education. The Harvest Strategy has a role in making students a focus of the educational process through their active participation in the educational situation that will increase their self-confidence and encourage them to persevere to raise their level of education. Harvest strategy plays a role in classroom management by involving students, exchanging views, and overcoming student boredom compared with the usual boredom of the classroom. The Harvest Strategy has contributed to the consolidation of information in students’ minds and the development of their positive thinking for a longer period than if the usual method was used.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

1. Caseau, N. Special education teachers use science technoig-society (stc) them of teach science to student with learning disabilities (journal of science teaching education). 1997; 8(1).
Effectiveness of Health Education Program on High Schools Students’ Perception of Hookah-Related to Health Problems in Baghdad City

Ali Fadhel Dawood1, Khamees Bandar Obaid2
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ABSTRACT

An experimental “pre-post design” was conducted to determine the effectiveness of health education program on students’ perception of hookah smoking. A systematic random sample was selected from students were selected from a school in Al-Karkh side; (66) students in each of the study and the control groups. The study results demonstrated that the age mean for the study group was 17.3 ± 1.3; more than a third age 17-years-old. For the study group, less than a half reported that they never smoked. For the control group, less than a half reported that they current smokers. There is a statistically significant difference in the mean score of hookah smoking perception for the study group between the pretest and posttest times. There is a statistically significant difference in the mean score of views about illness due to hookah smoking for the study group between the pretest and posttest times. Never smoked students have a sounder hookah smoking perception and better views about illness attributed to hookah smoking than those who are ex-smokers. Students whose fathers are current smokers have a sounder hookah smoking perception than those whose fathers never smoked.

Keywords: Hookah-Related to Health Problems, Effectiveness.

INTRODUCTION

Smoking tobacco has achieved scourge extents in a few nations around the globe, as indicated by the world Health Organization (WHO) this plague has turned out to be one of the primary general wellbeing dangers that the world has ever confronted. The WHO guesses there are more than five million person dies from the immediate tobacco utilize and 600,000 deaths from second-hand smoking every year; low- and center wage nations are most exceedingly bad influenced by tobacco as far as sickness and demise. The World Health Organization (WHO) anticipated that would ascend to >10 million by 2030 if the present pattern proceeds. Just about 70% of smoking deceases will be in creating states, 33% (~250 million) of which will be youngsters. Smoking cigarette is the most common method of tobacco use, which is widely reported, however, the hookah use is gaining popularity in the recent trends. Hookah smoking known by a variety of names like Shisha, Narghile, Ghoza, Hubble bubble and Water pipe is in vogue for the last many centuries, Its origin from one historical account suggested that it was designed in India by a physician Hakim Abul Fath through the reign of Emperor Akbar as a fewer dangerous technique of tobacco intake. But some optional that it was first used in Persia, South Africa, , and other nations. In the subcontinent, water pipe usually known as Hookah has been part of culture in most rural areas, It is gaining popularity between the youth very recently exclusively in urban cities.

MATERIALS AND METHOD

Design of the Study

An experimental “pre-post” design was used in the present study.
Administrative Arrangement

After getting the approval of the Council of College of Nursing for the study, and prior to data collection, the researcher submitted a detailed description of the study including the objectives and methodology (questionnaire) of the study to the Ministry of Planning (Central Statistical Organization), and to the Ministry of Education directorate in Baghdad city which consisted of General Directorate of Education in the province of Baghdad Al-Karkh III, in order to obtain an official permission to carry out the study. Later on, the permission was presented to the Schools in order to ensure the agreement and cooperation. The Consent form facilitated access to the Schools facilities to complete the study.

Setting of the Study

The study was conducted at one school in Baghdad City (Al-Sibttain High School); this school was randomly selected for data collection.

The Sample of the Study

A systematic random sample was selected from students who were studying in one school that was selected randomly from the list of high schools in Al-Karkh side. The sample were randomly selected and assigned into two groups; each group included (66) students. The health education materials were introduced to the study group only.

Statistical Analyses

The data were analyzed through the use of statistical procedures and using the package of SPSS (Statistical Process for Social Sciences) version 24 for windows. The descriptive statistical measures of frequency, mean, and standards deviation (SD) were used to describe the distribution of study variables. Bivariate correlation was used to investigate the association among the study variables. Furthermore, paired-samples T-test was used to determine the difference in scores of the hookah smoking perception and views about illnesses in the pre-post times. Mann-Whitney U test and Kruskal-Wallis test were used to investigate the distribution of means of scores for the dependent variables across the categories of independent variables.

RESULTS AND DISCUSSION

The age mean for the study group was 17.3 ± 1.3; more than a third age 17-years-old (n = 24; 36.4%), followed by those who age 16-years-old (n = 16; 24.2%), those who age 18-years-old (n = 12; 18.2%), those who age 20-years-old (n = 7; 10.6%), those who age 19-years-old (n = 5; 7.6%), and those who age 15-years-old (n = 2; 3.0%). For the control group, the age mean for the study group was 17.5 ± 1.3; less than a third age 18-years-old (n = 21; 31.8%), followed by those who age 17-yearsold (n = 17; 25.8%), those who age 16-years-old (n = 13; 19.7%), those who age 19-years-old (n = 7; 10.6%), those who age 20-years-old (n = 6; 9.1%), and those who age each of 14 and 15-years-old (n = 1; 1.5%). Concerning student’s birth rank order for the study group, more than two-fifth cam in the first rank (n = 29; 43.9%), followed by those who came in the second rank (n = 11; 16.7%), those who came in each of the third and fifth and lower ranks (n = 9; 13.6%), and those who came in the fourth rank (n = 8; 12.1%). For the control group, more than two-fifth cam in the first rank (n = 28; 42.4%), followed by those who came in the second rank (n = 14; 21.2%), those who came in the thirds ranks (n = 13; 19.7%), those who came in fifth and lower ranks (n = 6; 9.1%), and those who came in the fourth rank (n = 5; 7.6%). Regarding the SES for the study group, less than a half were within the lower middle class (n = 32; 48.5%), followed by those who were within the upper middle class (n = 21; 31.8%), those who were within the upper lower class (n = 12; 18.2%), and one student who was within the upper class (n = 1; 1.5%). Ultimately, the vast majority live in urban areas (n = 64; 97.0%) and a small proportion who live in suburban areas (n = 2; 3.0%). There is a statistically significant difference in the mean score of views about illness due to hookah smoking for the study group between the pretest and posttest times (p-value = .005). For the control group, there was no statistically significant difference in the mean score of views about illness due to hookah smoking between the pretest and posttest times. In the pretest time, students whose families were classified within the upper middle class have better views about illness attributed to hookah smoking than those whose families were classified within the upper lower SES class, and those whose families were classified within the lower middle class. Students whose families were classified within other SES classes were excluded from this analysis because of their limitedumber. However,
there is no statistically significant difference in the views about illness attributed to hookah smoking among SES groups. In the posttest time, students whose families were classified within the lower middle class have better views about illness attributed to hookah smoking than those whose families were classified within the upper middle class, and those whose families were classified within the upper lower SES class. Students whose families were classified within other SES classes were excluded from this analysis because of their limited number. However, there is no statistically significant difference in the views about illness attributed to hookah smoking among SES groups. The age mean for the study group was 17.3 ± 1.3; more than a third age 17-years-old (36.4%). This finding is consistent with Sterling and Mermelstein (2011) who reported that the mean age of their study sample was 17.6 ± 0.61 and Tarek, Mostafa, Burhan and Wassem (2010) who reported that the participants’ age went from 15 to 19 years with a mean of 17.5± 1.0. However, this finding is higher than that obtained by Karimy, Niknami, Hidarnia, Hajizadeh and Shamsi (2012) who detailed that of the members went from 14 to 19 years with a mean of 16.7 ± 1.5. On the other hand, this finding is higher than that obtained by Song & others (2009) who reported that the participants’ age mean was 14 ± 0.40. Regarding the socioeconomic status for the study group, less than a half were within the lower middle class (48.5%), followed by those who were within the upper middle class. This finding is inconsistent with Anjum, and others (2008) who announced that most elevated level of hookah smoking was observed between students belonging to the high socioeconomic group (65 %). There is a statistically significant difference in the mean score of views about illness due to hookah smoking for the study group between the pretest and posttest times.

This indicates the positive influence of the educational program in enhancing students’ hookah smoking perception. Regarding health perceptions, the opinion of students to whether hookah smoking is addictive increased after the intervention sessions (54% vs. 68%; p<0.001). Perceptions regarding hookah smoking has changed significantly after intervention, and the opinion regarding addiction associated with hookah smoking improved (Anjum et al; 2008). There was a statistically significant difference in the mean score of views about illness due to hookah smoking for the study group between the pretest and posttest times. This indicates the positive influence of the educational program in enhancing students’ views about illness due to hookah smoking. Anjum, et al.( 2008) reported that Perceptions regarding health hazards associated with shisha smoking changed significantly after the health awareness sessions. The students attributed shisha smoking to all forms of cancers specifically those of lips, bladder and lung. Strong positive association was also observed with infertility, high blood pressure and cardiovascular problems. In the pretest and posttest times, students whose fathers are ex-smokers have a sounder hookah smoking perception than those whose fathers never smoked, and those whose fathers are current smokers. This could be explained as that those fathers perceived the harmful effects of smoking and turned to warn their siblings and advise them to avoid smoking. In the pretest and posttest times, students whose fathers are ex-smoker have better views about illness attributed to hookah smoking than those whose fathers are current smokers, and those whose fathers never smoked. This could be explained as that those fathers perceived the harmful effects of smoking and turned to warn their siblings and advise them to avoid smoking.

**Table 1. Participants’ sociodemographic characteristics**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Study Group (n = 66)</th>
<th>Control Group (n=66)</th>
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<td>SD</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td>17.3</td>
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</tr>
<tr>
<td>5</td>
<td>7.6</td>
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Table 1. Participants’ sociodemographic characteristics

<table>
<thead>
<tr>
<th>Class</th>
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<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
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<th>df</th>
<th>Sig. (2-tailed)</th>
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<td>33.3</td>
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<td>-1.78</td>
<td>65</td>
<td>.162</td>
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<tr>
<td>Sixth</td>
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<td>33.3</td>
<td>19.884</td>
<td>2.328</td>
<td>Lower: -6.438, Upper: 2.862</td>
<td>-1.78</td>
<td>65</td>
<td>.162</td>
</tr>
</tbody>
</table>

Table 2. Difference in views about illness due to hookah smoking in the pretest-posttest times

<table>
<thead>
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<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td>Study Pretest-Posttest</td>
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<td>-5.18</td>
<td>65</td>
<td>.003</td>
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<tr>
<td>Control Pretest-Posttest</td>
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<td>65</td>
<td>.162</td>
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</tbody>
</table>

Table 3. Difference in views about illness attributed to hookah smoking among SES class groups (Study group)

<table>
<thead>
<tr>
<th>Ranks</th>
<th>SES Classes Study</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views about illness Pretest</td>
<td>Upper lower class</td>
<td>12</td>
<td>31.88</td>
<td>1.527</td>
<td>2</td>
<td>.466</td>
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<tr>
<td></td>
<td>Lower middle class</td>
<td>32</td>
<td>30.70</td>
<td>3.634</td>
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<td>.162</td>
</tr>
<tr>
<td></td>
<td>Upper middle class</td>
<td>21</td>
<td>37.14</td>
<td>3.634</td>
<td>2</td>
<td>.162</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Views about illness Posttest</td>
<td>Upper lower class</td>
<td>12</td>
<td>28.38</td>
<td>3.634</td>
<td>2</td>
<td>.162</td>
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<td>Lower middle class</td>
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<td>37.53</td>
<td>3.634</td>
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<td>.162</td>
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<td>Upper middle class</td>
<td>21</td>
<td>28.74</td>
<td>3.634</td>
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<td>Total</td>
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Table 4. Difference in views about illness attributed to hookah smoking between cigarettes smoking status groups (Study group)

<table>
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<tr>
<th></th>
<th>Ranks</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig.</th>
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<tr>
<td>Yes</td>
<td>11</td>
<td>25.77</td>
<td>283.50</td>
<td>217.500</td>
<td>243.500</td>
</tr>
<tr>
<td>No</td>
<td>55</td>
<td>35.05</td>
<td>1927.50</td>
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<tr>
<td>Total</td>
<td>66</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Views about illness Pretest

|                      |       |           |              |                |             |
| Yes                  | 11    | 37.32     | 410.50       |                |             |
| No                   | 55    | 32.74     | 1800.50      |                |             |
| Total                | 66    |           |              |                |             |

Table 5. Difference in views about illness attributed to hookah smoking among SES groups (Control group)

<table>
<thead>
<tr>
<th></th>
<th>Ranks</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
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<tbody>
<tr>
<td><strong>SES Classes</strong></td>
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<tr>
<td>Upper lower class</td>
<td>14</td>
<td>29.39</td>
<td>2.152</td>
<td>2</td>
<td>.341</td>
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<tr>
<td>Lower middle class</td>
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<tr>
<td>Upper middle class</td>
<td>23</td>
<td>30.41</td>
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</tr>
<tr>
<td>Total</td>
<td>65</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Views about illness Pretest

| Upper lower class    | 14    | 30.43     | 1.364      | 2  | .506        |
| Lower middle class   | 28    | 31.27     |            |    |             |
| Upper middle class   | 23    | 36.67     |            |    |             |
| Total                | 65    |           |            |    |             |

CONCLUSION

Participants’ age, SES, age on hookah smoking, and the number of cigarettes smoked per day are not influential factors in each of their perceptions of hookah smoking and views about illness due to hookah. The health educational program positively influenced students’ perception of hookah smoking and views about illness due to hookah smoking. Never smoked students have a sounder hookah smoking perception compared to current smokers. Never smoked students have better views about illness attributed to hookah smoking compared to ex-smokers and current smokers. Being ex-smoker fathers have a positive influence on siblings’ views about illness attributed to hookah smoking.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Pediatric Nursing, College of Nursing, University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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1. Abu-Helalah MA, Alshraideh HA, Al-Serhan A. Epidemiology, attitudes and perceptions toward cigarettes and hookah smoking amongst adults in Jordan. Environmental Health and Preventive


Isolation and Identification of *Streptococcus mutans* from Dental Caries by Using Sm479 gene

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1Department of Biology / College of Science for Women / University of Babylon, Iraq, 2Branch of Microbiology / College of Veterinary Medicine/ University of Kerbala, Iraq

**ABSTRACT**

About 165 samples collected from patients with dental caries infections from the Specialty Center of dentist in Hilla city during period 1/10/2017 to 10/2/2018, only 120 sample give positive result on M S B A media, *Streptococcus* was noticed with high ratio, *Streptococcus mutans* (51 %), *Streptococcus mitis* (28 %) and *Streptococcus salivarius* (21 %). All specimens were cultured on MSA agar with Bacitracin for isolation and detection of *S. Mutans*, then altered by the isolation on sub cultured (blood agar) for the detection of the hemolysis type to recognized *Streptococcus mutans* colony. For more detection of isolates antibiotic sensitivity test has been completed to show the resistance for antibiotic activity such as (Optechin, Amoxicillin and Bacitracin). Genetic detection was done by using specific gene for *Streptococcus mutans* this gene was the (sm479 gene) between all genus of Streptococci.

**Keywords:** Dental caries, *Streptococcus mutans*, Genetic detection, PCR amplification, Sm479 gene.

**INTRODUCTION**

*Streptococcus mutans* is the most cariogenic of all oral streptococci that lead to cause dental caries and it has adapted to surviving in environment of the mouth and metabolize a wide range of carbohydrate by non-oxidative pathway. Caries is caused by the secretions of the bacteria in the mouth that lead to localized breakdown of the dental tissues. Several molecular study has recently developed for promoting identification of target bacterial species isolates. Dietary sugars and amino acid provide pathogens organisms are present in oral cavity some of these commensalism can be associated with human diseases under certain condition. PCR amplification methods were widely used for detection of specificity of these species and considered as a reliable diagnostic tool for investigation bacterial isolates. *Streptococcus mutans* Pathogenicity represented by Adhesion property which mainly enable bacteria for establishing colonization to tooth surface and causes dental caries and Biofilm formation. A lot of the specific primers were directed to specific genes that are related with virulence in *S. mutans*, Sm479 gene which used for identification of *S. mutans* from all Streptococcus species that found in environment of oral cavity. Sm479 is species – specific gene has expanded, widely use, & show elevated rank of effectiveness for identification of microorganisms and evaluation *S. mutans* foundation in mouth & dental caries specimen. Kirby- Bauer method was described by Claus and Berkeley for determined *Streptococcus mutans* antibiotic susceptibility of *S. mutans* isolates for the first time. Recently, many commercial antibiotics have used against of *S. mutans* genus which it was identified from the dental caries samples called Multi-Drug Resistant (MDR). M D R is a natural happening affectation a severe to public health threaten and these therapeutic agents were accessible to cure or avoiding tooth decay, however, it is quit inclusive load of the sickness through promising of MDR.

**MATERIALS AND METHOD**

**Isolation and culturing of *Streptococcus mutans***

The specimens were spread on the modified M S A agar with 2 U / ml of Bacitracin and purified on the
same agar media by sub-culturing of isolates.\(^{10}\)

**Blood agar media**

All isolates were sub-cultured on Blood agar media to show blood hemolysis that can differentiate *S. mutans* from other streptococci species.\(^{10}\)

**Antibiotic sensitivity test**

Kirby - Bauer method was accomplished to complete this test according to the (Jubair, 2015). Isolates have streaked on Muller – Hinton agar and the antibiotic discs were placed equally spaced intervals on the surface of the medium with flamed forceps or a disc applicator and left for 15 minute, incubation was usually overnight with an optimal time of 14 hours at 37°C.\(^{8}\)

**Polymerase chain reaction**

Polymerase chain reaction has been used to amplification sm479 gene sequence as show in table (2) according to Promega manufacturing instruction, by adding material in table (3) to PCR tube and the final volume 20µl.

PCR green master Mix (Promega/ USA) has been divided into aliquots into individual PCR tubes (each aliquot was 20 l) and all the reaction components were kept on ice.

2 µl of forward and reverse primers were added.

1 µl of DNA pattern was added to the PCR Super Mix.

All these components have renounced in ultracentrifuge at 16000xg for 2 minutes.

The reactions were placed in a thermal cycler (Applied Biosystems) that had been preheated to 95°C and previously set up to the following cyclic conditions table (4)

**RESULTS AND DISCUSSION**

In this study research *S. mutans* was appeared in high frequency among specimen isolate about 48 specimen (51%), while *S. mitis* recorded (28 %) and *S. salivarius* reveal (21%). The shape of colony on MSBA agar were identified the Streptococcus from the other bacteria (Al-Mudallal et al , 2008)\(^{11}\). *S.mutans* appearance was elevated, convex, opaque colonies, granular (frosted glass), rough in appearance on MSBA agar media and usually have bead or bubble of liquid around colony because of excess of glucan production \(^{13}\). All isolates showed α- or γ- hemolysis can be observed around colonies of mainly strains, whereas β-hemolytic zones can also be observed with the colonies of a few strains as in\(^{11}\)researchers. Antibiotics used to demonstrate their influence on *S. mutans* isolates. Antibiotic disc method has been done to demonstrate the isolates either resistance or sensitive for one or more than one antibiotic. All isolates appeared resistance for (Optochin and Bacitracin ) and that agree by study of ( Al-Mudallal,2008)\(^{11}\), and it’s also resistance for (Amoxicillin ) and this agree with (Abdol-Wahed 2016)\(^ {12}\). The resistance of bacterial isolates against antibiotics activity was thought to increase its virulence due to biofilm formation , composition of the biofilm and the physiological properties of its organisms which control the transformation of antibiotic molecules by carbohydrates that block the transmission of antibiotics into the membrane or through the association with ionic bond. Amoxicillin is a broad spectrum in dentist’s career; it has been described to patients prior to massive dental procedures. Uses of penicillin in the prophylactic treatment has reduced the infection, but if had taken for long period generates resistance strains\(^ {13,14}\). This study used a specific primer investigation for the virulence of *S. mutans* this primer was the (sm479) gene primer. DNA was isolated from the bacteria samples of the *S. mutans* and then electrophoresed on agarose gel electrophoresis for detection of virulence gene sm479. About 48 isolate were demonstrated a clearly band in size of (435bp) and 2 isolate failed to form a bands and that agree with (Zadeh 2016) study\(^ {6}\).

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Potency</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>50</td>
</tr>
<tr>
<td>AX</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
</tr>
</tbody>
</table>

**Table 1. Antibiotic used in this research**

<table>
<thead>
<tr>
<th>Sm479</th>
<th>Sense</th>
</tr>
</thead>
<tbody>
<tr>
<td>5’ TC GCAGAAAAGATAAACAACAAACA</td>
<td>3’</td>
</tr>
<tr>
<td>antisense</td>
<td>5’ GCCCCTTACAGTGGTCTAG</td>
</tr>
</tbody>
</table>

**Table 2. Sequence of Sm479 gene**
Table 3. Show content of PCR tube.

<table>
<thead>
<tr>
<th>Chemical compound</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master mix</td>
<td>5 µl</td>
</tr>
<tr>
<td>DNA</td>
<td>1 µl</td>
</tr>
<tr>
<td>Sense primer</td>
<td>2 µl</td>
</tr>
<tr>
<td>Antisense primer</td>
<td>2 µl</td>
</tr>
<tr>
<td>Deionizer D.W</td>
<td>10 µl</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20 µl</td>
</tr>
</tbody>
</table>

Table 4. Show PCR condition for sm479 gene.

<table>
<thead>
<tr>
<th>Step</th>
<th>Temp. C°</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>94</td>
<td>5 mine.</td>
</tr>
<tr>
<td>Denaturation</td>
<td>94</td>
<td>1 mine.</td>
</tr>
<tr>
<td>Annealing</td>
<td>56</td>
<td>1 mine.</td>
</tr>
<tr>
<td>Elongation</td>
<td>72</td>
<td>2 mine.</td>
</tr>
<tr>
<td>Final Elongation</td>
<td>72</td>
<td>7 mine.</td>
</tr>
</tbody>
</table>

CONCLUSION

In this study research *S. mutans* was appeared in high frequency among specimen isolate about 48 specimen (51.5%), while *S. mitis* recorded (28.3%) and *S. salivarius* reveal (21.1%). This study used a specific primer investigation for the virulence of *S. mutans* this primer was the (sm479) gene primer. DNA was isolated from the bacteria samples of the *S. mutans* and then electrophoresed on agarose gel electrophoresis for detection of virulence gene sm479. About 48 isolate were demonstrated a clearly band in size of (435bp) and 2 isolate failed to form a band.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Veterinary Medicine/University of Kerbala, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effectiveness of Post-Abortion Family Planning Counseling Program on Nurses-Midwives’ Knowledge in Middle Euphrates Maternity Hospitals

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ABSTRACT

Objectives: To determine the effectiveness of post-abortion family planning counseling program on nurses–midwives’ knowledge and to predict the variables which may effect on their knowledge. A quasi experimental study was conducted from 23rd April 2017 to 14th March 2018 in three governorates where reside in the Middle Euphrates of Iraq: (Holy Karbala, Al - Najef and Babylon) on nurses and midwives who work at maternity hospitals. A probability sample was used to select 122 nurses and midwives, (60) of them for study group and (62) for control group. The results of study indicated that nurses – midwives’ knowledge assessment before the implementation of program for both study and control groups was low related to post abortion family planning counseling. There were high significant differences in participants’ knowledge at pretest and posttest for study group which exposed to program implementing. Educational level was effect on their knowledge for both groups. The study findings showed that program had been an effective method of increasing the nurses – midwives’ knowledge about post abortion family planning counseling. An educational level variable was significant effect on nurses – midwives’ knowledge for both groups, while social status was effecting on nurses – midwives’ knowledge for only study group.

Keywords: Effectiveness of Program, Post-Abortion, Family Planning Counseling, Nurses-Midwives Knowledge.

INTRODUCTION

Counseling is a critical component in providing quality post-abortion family planning services and involves communication between a health care provider as counselor and a post abortion woman as beneficiary to help the woman for understanding the concepts of family planning methods and to choose a method based on her needs and preference¹. Globally, 80 million of women have unintended pregnancies, 44 million have an induced abortion, and of these about 22 million are unsafe, 31 million have spontaneous abortions or stillbirths, 47,000 women die due to unsafe abortion that is accounting for about 13% of all maternal deaths. Therefore, family planning is recognized as a key life-saving intervention for mothers and their children ². The majority of women have abortion or post-abortion care do not want to become pregnant again in the near future. Because of these issues that it is important for nurses and midwives to know the family planning needs of women during this critical period³. Nurses provide discharge planning after childbirth; they commonly staff family planning clinics and provide contraceptive information to those women and others in the community. Education concerning contraceptive use in the post- abortion period is a common component of discharge planning in many countries, with wide variation among health care delivery systems⁴. Post-abortion family planning counseling should be comprehensive and address the many issues related to health including: birth spacing information, family planning methods and available family planning systems.
services, sexual transmitted infection evaluation and treatment, and Human immunodeficiency virus (HIV) counseling and testing. Women who have experienced an unintended pregnancy need to know that ovulation occur approximately within 10 to 11 days after a first trimester abortion and within 4 weeks after a second trimester abortion, therefore, must be given information on contraception. Counseling must also provide women with information on the advantages of family planning, as well as method choices and the health implications of these selections including side effects, risks, and failure rates.

MATERIALS AND METHOD

A quasi experimental design was conducted throughout the present study with the application of pretest and post-test approach on nurses and midwives for both study and control groups regarding post-abortion family planning counseling knowledge from 23th April 2017 to 14th March 2018. Probability sampling approach, Systematic random sampling was used to collect the data from subjects (nurses and midwives) who work at maternity hospitals in three governorates where reside in the Middle Euphrates of Iraq: (Holy Karbala, Al - Najef and Babylon), 122 nurses and midwives were selected, (60) of them for study group and (62) for control group. Drop outs of sample were 22 participants to be the entire sample consist of (100) nurses and midwives, (50) of them for each group. The criteria for selecting the study sample are: nurses –midwives who are working in the morning and night shifts, different educational levels, who are working in wards are: delivery rooms, intensive care units, maternal wards and maternal emergency, and who agree to participate in the study. The sample is exposed to pretest to assess knowledge for both study and control groups, then the implementation of program was carried out by the researcher on the study group only, while posttest was applied on both study and control groups. A program is constructed to contain four components: counseling concept, communication skills, family planning methods and dual protection. Instrument is constructed relative to program, to determine the effectiveness of the program on nurses-midwives’ knowledge concerning post-abortion family planning counseling. The questionnaire was instrument of study consisted of two parts which includes socio-demographic characteristics and knowledge that consisted of (25) questions regarding post – abortion family planning counseling knowledge. These questions were designed as multiple choices. The rating score of response options were (2) for a truth answer and (1) for a false answer with cut-off point (1.5). The questionnaire sheet consists of two main domains of knowledge: First domain about counseling which comprised of (12) questions and second domain about Family Planning Methods which comprised of (13) questions. The program and the instrument’s content validity is determined through panel of (16) experts. A pilot study was conducted before starting actual data collection on (10) nurses and midwives who work at Gynecology and Maternity Teaching Hospital in Holy Karbala Governorate. The pilot study was conducted to find out whether the items of questionnaire were clearly understood, applicable and to determine the reliability and to estimate the time required for the interview. The reliability of instrument was determined through the test and re-test approach, with distance period two weeks between these tests. The result of the reliability was ($r^2= 0.924$) with Pearson correlation coefficient was calculated ($r = 0.859$) for knowledge items. To analyze the data, statistical procedures were used as descriptive statistic (frequency, mean, percentage, standard deviation) and inferential statistic (Pearson correlation, T-tests and simple linear regression) with a p-value less than 0.05 were considered significant.

RESULTS AND DISCUSSION

Analysis of demographic variables indicated that the highest percentages (34%) and (60%) of the nurses and midwives for both study and control groups respectively and within age groups (20 - 24 years old) with mean and standard deviation (SD) of age for both groups were (30.44 ± 8.39), (25.74 ± 7.78) respectively. This result agree with a study was conducted by Atuahene et al. (2016) who reported that mean age with a standard deviation of participants was (31.5 ± 9.8) years. The highest percentage (26%) of the subjects in the study group were graduated from nursing secondary, while the highest percentage (28%) of the participants in the control group were graduated from nursing institute. The findings of present study are inconsistent with those of Ali (2013) who reported that mean age with a standard deviation of participants was (31.5 ± 9.8) years. The highest percentage (26%) of the subjects in the study group were graduated from nursing secondary, while the highest percentage (28%) of the participants in the control group were graduated from nursing institute. The findings of present study are inconsistent with those of Ali (2013) who reported that mean age with a standard deviation of participants was (31.5 ± 9.8) years.
the control group were single. The findings of present study are inconsistent with those of Omishakin (2015) who reported that majority of respondents (72%) were married while (28%) were single 8. The highest percentages (32%) and (28%) for both study and control groups respectively were had (5 – 9) years with the mean and standard deviation (SD) of years for both groups were (8.02 ± 6.01) and (8.68 ± 6.09) respectively. This inconsistent with those of Atuahene et al. (2016) who stated that the length of experience was: less than 1 year (21.1%), 1–2 years (49.1%), more or equal 3 years (29.8%) 6. The findings of present study reveal that there are not differences between study and control groups related to nurses – midwives’ knowledge about post abortion family planning counseling at pretests as well as the findings revealed that there were low grand mean scores in all domains for both groups at pretests (before implementation of an education program) as shown in table (1) by using of an independent samples t-test. So the researcher accepted the null hypothesis and rejected the alternative hypothesis which means that there was no a significant difference in nurses – midwives’ knowledge between pretests for both study and control groups (Mean for study group at pretest = Mean for control group at pretest). The findings of present study depicted there were low means and assessed as low in all items of nurses and midwives’ knowledge related to family planning methods in pretest (before implementation of an education program), while there were high means and assessed as high in all items in posttest (after implementation of an education program) for study group with high statistical significant differences in all items between pre and post periods for study group as shown in table (2) by using of paired samples t-test. So the researcher accepted the alternative hypothesis and rejected null-hypothesis which means that there was a significant difference in nurses – midwives’ knowledge concerning family planning methods between pre and post-tests for the program implementation (Mean pre ≠ Mean post) at p-value ≤ 0.05. The findings of present study correspond with those of Bamufleh et al. (2017) who reported when they assessed participants’ knowledge of different postpartum family planning types, advantages, side effects and mechanisms of action during pretest period (before an education program) were found that the most participants had poor knowledge range and mean level score was low, which indicates a low level of knowledge. While after an education program during posttest period, the knowledge levels improved significantly to adequate level for all contraceptive types 9. Also the findings of current study are agreement with those of Savelieva et al. (2003) who reported that the nurses-midwives knowledge regarding post abortion family planning methods was changed between pretest and posttest 10. Findings of current study showed there were high significant differences between both groups at posttests for all main domains concerning nurses – midwives’ knowledge. In addition, an assessment of knowledge was high for study group and low for control group at posttest as shown in table (3). Present findings revealed that educational level variable was significant effect on nurses – midwives’ knowledge for both study and control groups. While social status was effect on participants’ knowledge for only study group. Other variables: age and years of experiences were not effect on nurses – midwives’ knowledge is shown in table (4) by using simple linear regression test. The findings of present study are consistent with study of Hoffman et al. (2016) who reported throughout using of logistic regression analysis, that educational level was significant effect variable on the participants’ knowledge scores related to family planning 11.

<table>
<thead>
<tr>
<th>Main Domains</th>
<th>Study group (pretest)</th>
<th>Control group (pretest)</th>
<th>Asymp. sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GMS</td>
<td>GMS</td>
<td>t</td>
</tr>
<tr>
<td>A. Counseling Knowledge</td>
<td>1.27</td>
<td>1.29</td>
<td>1.887</td>
</tr>
<tr>
<td>B. Family Planning Methods Knowledge</td>
<td>1.19</td>
<td>1.18</td>
<td>5.052</td>
</tr>
<tr>
<td>Overall Domains of Knowledge</td>
<td>1.23</td>
<td>1.24</td>
<td>4.447</td>
</tr>
</tbody>
</table>

Table 1. Differences Between Study and Control Groups Related to Nurses – Midwives’ Knowledge about Post Abortion Family Planning Counseling at Pre Tests.
Table 2. Differences in Nurses – Midwives’ Knowledge Regarding Post abortion Family Planning Counseling between Pretest and Posttest For Study Group. n=50

<table>
<thead>
<tr>
<th>Main Domains</th>
<th>periods</th>
<th>Paired Statistic</th>
<th>Paired Samples Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>SD</td>
</tr>
<tr>
<td>A. Counseling Knowledge</td>
<td>pre</td>
<td>15.12</td>
<td>1.72</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>23.44</td>
<td>0.71</td>
</tr>
<tr>
<td>B. Family Planning Methods Knowledge</td>
<td>pre</td>
<td>15.66</td>
<td>1.72</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>25.36</td>
<td>0.83</td>
</tr>
<tr>
<td>Overall Domains of Knowledge</td>
<td>pre</td>
<td>30.78</td>
<td>2.65</td>
</tr>
<tr>
<td></td>
<td>post</td>
<td>48.80</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Table 3. Difference in Nurses – Midwives’ Knowledge Regarding Post abortion Family Planning Counseling between Both Study and Control Groups at Posttests.

<table>
<thead>
<tr>
<th>Main Domains</th>
<th>Group Statistics</th>
<th>Independent Samples T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Groups</td>
<td>n</td>
</tr>
<tr>
<td>A. Counseling Knowledge</td>
<td>Study</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>50</td>
</tr>
<tr>
<td>B. Family Planning Methods Knowledge</td>
<td>Study</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>50</td>
</tr>
<tr>
<td>Overall Domains of Knowledge</td>
<td>Study</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 4. Effect of Demographical Characteristics on Nurses – Midwives’ Knowledge related to Post Abortion Family Planning Counseling for Both Study and Control Groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Study Group (n=50)</th>
<th>Control Group (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>F</td>
</tr>
<tr>
<td>Independent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.17</td>
<td>1.35</td>
</tr>
<tr>
<td>Educational level</td>
<td>0.33</td>
<td>5.83</td>
</tr>
<tr>
<td>Social Status</td>
<td>0.31</td>
<td>4.97</td>
</tr>
<tr>
<td>Years of experiences</td>
<td>0.13</td>
<td>0.78</td>
</tr>
</tbody>
</table>
CONCLUSION

The study findings showed that program had been an effective method of increasing the nurses – midwives’ knowledge about post abortion family planning counseling. An educational level variable was significant effect on nurses – midwives’ knowledge for both groups, while social status was effecting on nurses – midwives’ knowledge for only study group.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Health, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

Nutritional Habits of Adolescents and Their Nutritional Health Needs

Ghufran Awda Sajet1, Hussein Jasem Mohammed1
1Community Health Nursing, Faculty of Nursing, University of Babylon, Iraq

ABSTRACT

Dietary knowledge and access to resources are critical to improve health and nutritional need in a sustainable way. Healthy eating in adolescence is also important for healthy growth and human development. The dietary pattern used during adolescence may contribute to the treatment of eating disorders and increase the risk of a number of important chronic diseases later in life. The outcomes of the current investigation indicate that the food pattern of 57.3% of the sample is the vegetative type, 38.4% of them the food pattern is the Mediterranean style and only 4.3% follow the meat pattern. In this study, 55.1% were found to be malnourished (53.0% were underweight and 2.1% were obese). In the bright of the results, here is a necessity and space for the project and implementation of teens programs for nutrition teaching and a focus on wellbeing teaching that shall develop the well-being and nourishing state of teenagers and establish research models on adolescent nutritional patterns. More broadly.

Keyword: Adolescents, Nutritional habits, Healthy growth, Human development.

INTRODUCTION

Teenage (10–19 years) is a defenseless time of life as wellbeing related practices that drive the major long-lasting degenerative infections begin or are fortified in this time. Adolescents’ nutrition models are chief determinants of both their present and future wellbeing. Dietary eating during the teenager’s years has a main part in both the counteractive action and treatment of sicknesses. Likewise, dietary examples and behavior acquired in high school years are additionally probable to proceed all through adulthood. Adolescence is a time of rapid growth and human development, after infancy. Sufficient intake of foods and nutrients contribute considerably to the growth and development during the adolescence period particularly among the girls, the future mothers. The World Health Organization (WHO, 2004) has documented the expanding commonness of NCDs: Non-transferable Chronic Diseases and its corresponding relationship to mortality. Hence, the WHO has characterized rules for the reception of open strategies went for advancing solid ways of life and dietary models. Stoppage of widespread NCDs in adulthood is practical, but is subject to way of life got the hang of amid kids and teenagers.

MATERIALS AND METHOD

A descriptive survey is showed on secondary schools in Thi-Qar governance. The study is carried out to the adolescent dietary pattern from 25th November 2017 to 5th August 2018. The sample were 670 teenagers, doled out in 28 schools in ThiQar governorate. Through an extensive review of relevant literature the researcher use developed questionnaire to achieve objectives of the study. It is one questionnaire form and the overall items included in these questionnaires are demographic data of the sample include age, level of education, occupation, and monthly income, (46) items (student dietary intake (24), dietary habits (22) in addition to 24-hours diet recall. The period from 7th December 2017 to 8th March 2018, for A structured interviews were constructed with adolescent who were attended secondary school Thi-Qar governorate to complete the questionnaire after a permission was arranged from education sector and an agreement of participation was obtained from the adolescents to the interview, most of the adolescents were attending secondary school at

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morning and afternoon, and they answer questionnaire, the researcher gathered these information in the classroom.

**Statistical Data analysis**

The data of the present study are analyzed through the use of Statistical Package of Social Sciences (SPSS) version 23. The following statistical data analysis approaches are used in order to analyze and evaluate the results of the study:

**Descriptive data analysis**

This approach was performed through the determination of: Frequency and Percentage, Stand deviation (SD) and D. Summary Statistics tables including: Mean, Mean of scores.

**Inferential Data Analysis**

- Chi-Square ($\chi^2$) test

**RESULTS AND DISCUSSION**

Data analysis results were presented. These results are structured as follows: Six hundred and seventy adolescents were included in this study. Table (4-1) shows that (53.0%) of the adolescents were between (12-15) years old, (60.9%) were female, (53.0%) of adolescents were under weight. Table 2 showed that (47.9%) had (always) eat breakfast, and (47.2%) had (sometimes) minimize sugar intake, and (42.5%) had (sometimes) minimize salt intake, and (70.3%) had (always) drink enough fluids, and (62.7%) had (always) eat fruits and vegetables. The table showed (43.7%) had (sometimes) minimize intake of fats and oils, and (46.1%) had (never) select non-vegetable protein (meat) without fat, and (45.2%) had (sometimes) minimize intake of presweetened foods, and (39.0%) had (sometimes) eat doughnuts, and (35.1%) had (never) eat enough food into one meal. Table 3 showed that (57.3%) were acceptable dietary pattern, (36.3%) were normal dietary pattern, (4.3%) were poor dietary pattern and (2.1%) were Healthy dietary pattern. Table (1) analyzed that (670) of adolescents participate in this study, the most group age was between (12-23) years, which similar to his study a Belgian study indicates sufficient reliability and validity of the HBSC (Health Behavior of School aged Children) food frequency questionnaire for relationship examinations. Starting around the age of 10, the psychological procedures of youngsters and youths turn out to be more like those of grown-ups, which additionally corroborated the utilization of sustenance recurrence polls in the pertinent age gathering (13–19 years). Table (1) analyzed that (55.1%) malnutrition i.e. (53.0% were underweight and 2.1% were obese) which similar to which his finding was mainstream (53.5%) were undernourished, i.e. 38.6% were underweight, 10.1% were overweight. Table (2) analyzed that (33.0% = never) and (43.7% = sometimes) had diminish intake of fats and oils. Results about teenagers have an extensive variety of one of a kind grouping designs and the most widely recognized bunching design was a high creature lipid and salt eating regimen. Table (3) analyzed that (4.3% (n=29) had (poor dietary pattern) and (57.3%) (n=384) had (acceptable dietary pattern) which similar to teenagers detailed undesirable eating designs, and their nourishment inclinations were high in fat, salt, and sugar. On the off chance that these nourishment designs (counts calories high in salt and fat and low in organic products, vegetables, and fiber) continual, these could represent a danger of ceaseless ailments, particularly corpulence, heart assault, and most likely malignancy.

**Table 1. The distribution of the study sample by their demographical data**

<table>
<thead>
<tr>
<th>No.</th>
<th>Age(years)</th>
<th>Frequency(F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12-15</td>
<td>355</td>
<td>53.0</td>
</tr>
<tr>
<td></td>
<td>16-19</td>
<td>303</td>
<td>45.2</td>
</tr>
<tr>
<td></td>
<td>20-23</td>
<td>12</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Frequency(F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Male</td>
<td>262</td>
<td>39.1</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>408</td>
<td>60.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>BMI</th>
<th>Frequency(F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>underweight:-under 18.5 kg/m</td>
<td>355</td>
<td>53.0</td>
</tr>
<tr>
<td></td>
<td>normal weight: 18.5 to 25,</td>
<td>301</td>
<td>44.9</td>
</tr>
<tr>
<td></td>
<td>obese: over 30.</td>
<td>14</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 2. The distribution of the study sample by their habitual dietary data.

<table>
<thead>
<tr>
<th>NO.</th>
<th>Characteristics</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>I minimize sugar intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>219</td>
<td>32.7</td>
</tr>
<tr>
<td></td>
<td>Some time</td>
<td>316</td>
<td>47.2</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>135</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Mean = 1.87</td>
<td>SD = .717</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I minimize salt intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>238</td>
<td>35.5</td>
</tr>
<tr>
<td></td>
<td>Some time</td>
<td>285</td>
<td>42.5</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>147</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Mean = 1.86</td>
<td>SD = .746</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I drink enough fluids</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>69</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>Some time</td>
<td>130</td>
<td>19.4</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>471</td>
<td>70.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Mean = 2.60</td>
<td>SD = .668</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I eat fruits and vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>63</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>Some time</td>
<td>187</td>
<td>27.9</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>420</td>
<td>62.7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Mean = 2.53</td>
<td>SD = .662</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Shows the dietary pattern total score of the items.

<table>
<thead>
<tr>
<th>NO.</th>
<th>Characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poor dietary pattern</td>
<td>29</td>
<td>4.3</td>
</tr>
<tr>
<td>2</td>
<td>Acceptable dietary pattern</td>
<td>384</td>
<td>57.3</td>
</tr>
<tr>
<td>3</td>
<td>Normal dietary pattern</td>
<td>243</td>
<td>36.3</td>
</tr>
<tr>
<td>4</td>
<td>Healthy dietary pattern</td>
<td>14</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>670</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Mean = 43.83</td>
<td>SD = 5.734</td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION

Healthy dietary pattern only 2.1%. Many of them do not minimize intake of fats and oils. Majority of them drink sugar-sweetened beverage daily (sweetened fruit drink, sweetened coffee, sweetened tea, energy drink, player drink. Majority of them know the healthy dietary pattern, but do not follow that, there is gap between knowledge and practice.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Community Health Nursing, Faculty of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

Postoperative Risk Factors of Surgical Cardiac patients’ that Leading to Prolonged Mechanical Ventilation at South Iraq Cardiac Centers

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1 MSc. Assistant Lecturer, Community Health Nursing Department, College of Nursing/ University of Misan, Iraq, 2 MSc. Assistant Lecturer, in the field of Nursing Administration, College of Nursing/ University of Misan, Iraq, 3 MSc. Assistant Lecturer, Adult Nursing Department, College of Nursing/ University of Misan, Iraq

ABSTRACT

Cardiac surgery is a Common way to treat diseases of coronary artery and valves disease. Weaning from mechanical ventilation and extubation of endotracheal tube usually proceed directly. Objective(s): to assess the postoperative risk Factors of surgical cardiac patients’ which leading to prolonged mechanical ventilation. To identify the relationships between duration of intubation of mechanical ventilation and postoperative risk factors. Retrospective study design was conducted to determine the postoperative risk factors that leading to prolonged mechanical ventilation for surgical cardiac patients’ at south Iraq cardiac centers. The study was carried out during the period extended from 21 March 2018 to 31 June, 2018 A non-probability sample of 100 adults patients records who stayed on prolonged mechanical ventilation after cardiac surgery admitted in thi qar center for heart diseases. The result of postoperative risk factors for (100) patients Indicated that the (66%) of the sample were at Simv mode in related to ventilator modes. According to the perioperative IABP requirement the table indicated that the (10 %) of the patients need to IABP. Significant relationship between the duration of stay on mechanical ventilation with, quantity of bleeding, reoperation for bleeding, reintubation, ventricular arrhythmia, stroke and infection level significantly less or equal. 0.05.

Keyword: postoperative risk factors, duration of intubation, cardiac surgery patients.

INTRODUCTION

Cardiac surgery is a Common way to treat diseases of coronary artery and valves disease. Weaning from mechanical ventilation and extubation of endotracheal tube usually proceed directly. Patients who extubation of endotracheal tube before time may reflect premature extubation or may be a marker of sicker patients. Too early extubation may result in disruption of respiratory, right heart failure, and myocardial infarction and ischemia1. Cardiac surgical procedure carries morbidity and mortality relatively high compared with most other surgical operations. This is not only because of the nature of the surgery itself, but also because of the satisfactory common heart and respiratory and other. Before Surgery focus should be on the Patients history and examination of the assessment of the severity of the heart disease ischemic heart failure, as well as the existence of common and severity illness such as diabetes, high blood pressure and diseases related to smoking 2. The main risk factors include the negative consequences of cardiac surgery advanced age, emergency surgery, previous heart surgery, dialysis dependence, and creatinine level of 2 mg/dL or higher (Renal failure before the surgery is an independent risk factor rates of morbidity and mortality 3. Mechanical ventilation (MV) is one of the main actions in the comprehensive care unit (ICU). That includes Invasive mechanical fresh air (mv) Procedure: intubation, the course of the air ventilation positive pressure, often application of sedative and muscles relaxants. Endotracheal pipe can cause damage to the trachea, ulceration of trachea, pulmonary edema.
and swelling. The duration of mechanical ventilation for patients with heart surgery is among the factors that affect morbidity and mortality rates, as well as the cost of the procedure and use of health-care resources in general. Many of the investigators in the delayed extubation the patient with high mortality rates. The number of patients who are receiving mechanical ventilation and support is growing rapidly as a result of improvements in life to provide medical treatment for patients with critical cases, anaging population and expanding the use of the surgical operations of aggression. Long periods of historical annual increase in the use of mechanical ventilation in the United States nearly 5.5% compared with an increase of 1% annually in the hospitals in the United States. Estimates indicate that the number of the population of patients who are receiving mechanical ventilation for extended periods of time in the United States and more than doubled by 2020 and about 605898 cases. Increase duration of mechanical ventilation leading to high cost and effort for health policies. The aim of this study was to identify the risk factors for prolonged mechanical ventilation.

MATERIALS AND METHODS

Retrospective study design was conducted to determine the postoperative risk factors that leading to prolonged mechanical ventilation for surgical cardiac patients at south Iraq cardiac centers. The study was carried out during the period extended from 21 March 2018 to 31 June, 2018. A non-probability (purposive) sample of 100 adults patients chart who stayed on prolonged mechanical ventilation after cardiac surgery admitted in Thi Qar center for cardiac surgery in south Iraq through two years (2016-2017). Data was collected by revision the patient’s chart. Questionnaire form was constructed for purpose of the study and it comprised of from (10) common postoperative risk factors related to patient with cardiac surgery. Validity of the questionnaire was determined through a panel of (10) experts. Reliability and validity of questionnaire was determined through Cronbach Alpha = 0.80. Data were analyzed by using descriptive statistical approach (frequency, percentage and mean of score) and inferential statistical approach (standard deviation and independent sample t-test and Anova test).

RESULTS AND DISCUSSION

The result of postoperative risk factors for (100) patients indicated that the (66%) of the sample were at Simv mode in relation to ventilator modes. Regarding to quantity of bleeding the highest percentage (59 %) of the patients lost (25-500)ml. According to the perioperative IABP requirement the table indicated that the (14 %) of the patients need to IABP. Concerning the Re-operation for bleeding the table showed that the (14 %) of the patients Re-operation for bleeding. Related to Re-intubation the table declared that the (5 %) of the patients Re-intubation. According to the atrial arrhythmia the table explained that the (17 %) of the patients with atrial arrhythmia. Regarding to ventricular arrhythmia the table indicated that the (3 %) of the patients with ventricular arrhythmia. In related to the renal disorders the table showed that the (9 %) of the patients with renal disorders. Concerning the stroke (17%) of patients had stroke, (3%) of patients with infection risk factors. This table (2) shows that a statistical significant association between duration of intubation with quantity of bleeding, reoperation for bleeding, reintubation, Ventricular Arrhythmia, Stroke and infection. P value ≥ 0.05), while there were no statistical association between duration of intubation with (ventilator modes, IABP requirement, atrial arrhythmia and renal disorder). The result of postoperative risk factors for (100) patients Indicated that the (66%) of the sample had Simv mode in relation to ventilator modes. Regarding to the quantity of bleeding, the mean of quantity of bleeding of the patients were (463.25) ml and (17%) of patients have stroke. The current study was consistent with in term ventilator modes, quantity of bleeding and stroke who study the Preoperative, intraoperative, and postoperative characteristics of patients undergoing isolated CABG between June 2005 and June 2008 at the Tongji Hospital were retrospectively analyzed, To evaluate the independent risk factors for late extubation after coronary artery bypass grafting he found that the mean of quantity of drainage was (362) ml and (17%) of patients have stroke. The finding showed that the (14%) of the patients need to IABP. This finding supported with result obtain by which found that the (13.5 %) of patients with prolonged ventilation need to the Intra-aortic balloon pump in their study to determine outcomes and predictors of prolonged ventilation in patients undergoing elective coronary surgery. Concerning the Re-operation for bleeding the table showed that the (4%) of the patients had Re-operation for bleeding and that the (12 %) of the patients with ventricular arrhythmia. In related to the renal disorders, the results indicated...
that the (9%) of the patients had renal disorders. This result comes along with a study done by (7) there were studied pre-, intra- and post-operative data of patients without a history of chronic obstructive pulmonary disease undergoing isolated CABG from January 2003 to December 2008 in our center were retrospectively analyzed, to evaluate the independent risk factors for ventilator dependency following coronary artery bypass grafting which found that (5.4%) of patients Re-operation for bleeding and that the (1.2%) of the patients with ventricular arrhythmia. In regarding to the renal disorders, he found that the (12.3%) of the patients had renal disorders. Related to Re-intubation, the table showed that the (5%) of the patients have Re-intubation and (17%) of the patients had atrial arrhythmia. In regarding to infection the results indicated that the (3%) of patients had infection. This result was similar to that obtained from 9 in their study to identify the risk factors for prolonged invasive mechanical ventilation after open heart surgery they found (3%) of patients with prolonged mechanical ventilation had infection. This finding showed a statistical significant association between the quantity of bleeding and duration of intubation. This finding was supported with the result obtained by 10 who stated the significant association between bleeding after cardiac surgery and prolonged ventilation. This result was supported by 11 who stated the statistical significant association between bleeding after cardiac surgery and prolonged ventilation and the bleeding important cause for prolonged mechanical ventilation. A statistical significant association was found between reoperation for bleeding and duration of intubation. This result was similar to that obtained from 12 who indicated the significant association between the reoperation for bleeding and duration of intubation supported this finding through their study which stated that the significant association between the bleeding and duration of intubation. There was statistical significant association between reintubation and duration of intubation. This result comes along with a study done by 14 who stated that the significant association between the re-intubation and total time of mechanical ventilation in their study endotracheal re-intubation following coronary artery bypass grafting. There was statistical significant association between the ventricular arrhythmia and duration of intubation. This result was similar to that obtained from 15 indicated that the significant association between Ventricular Arrhythmia and Prolonged ventilation after adult heart valve surgery. There was statistical significant association between the Stroke and duration of intubation. This result is confirmed by 16 who stated that the statistical significant association between Stroke and prolonged mechanical ventilation when he studied major neurologic dysfunction after coronary bypass surgery. There were statistical significant association between infection and duration of intubation, this result was supported by 17 which refer to that the significant association between infection and duration of intubation in patients undergoing cardiac surgery. In addition to no significant association between duration of intubation with (P value ≥ 0.05). There was no statistical association between ventilator modes, atrial arrhythmia IABP requirement, renal disorder and duration of intubation.

Table 1. Distribution of Cardiac Surgery Patients with Prolonged Mechanical Ventilation by their Postoperative Risk Factors.

<table>
<thead>
<tr>
<th>Postoperative Risk Factors</th>
<th>F.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ventilator Modes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIMV</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>PS</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>CVM</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Quantity Of Bleeding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(25-500)ml</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>(525-1000)ml</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(1025-1500)ml</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>(1525-2000)ml</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 1. Distribution of Cardiac Surgery Patients with Prolonged Mechanical Ventilation by their Postoperative Risk Factors.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perioperative IABP requirement</td>
<td>14</td>
<td>86</td>
<td>100</td>
</tr>
<tr>
<td>Reoperation For Bleeding</td>
<td>12</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Reintubation</td>
<td>5</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Atrial Arrhythmia</td>
<td>17</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Ventricular Arrhythmia</td>
<td>3</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>Renal disorder</td>
<td>9</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>Stroke</td>
<td>17</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Infection</td>
<td>3</td>
<td>97</td>
<td>100</td>
</tr>
</tbody>
</table>

N= 100

Table 2. Association between Duration of Intubation and Postoperative Risk Factors among Cardiac Surgery Patients with Prolonged Mechanical Ventilation.

<table>
<thead>
<tr>
<th>Duration Of Intubation</th>
<th>Quantity Of Bleeding</th>
<th>No.</th>
<th>%</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(25-500)ml</td>
<td>59</td>
<td>59</td>
<td>16.27 ±3.468</td>
</tr>
<tr>
<td></td>
<td>(525-1000)ml</td>
<td>36</td>
<td>36</td>
<td>15.22 ±2.919</td>
</tr>
<tr>
<td></td>
<td>(1025-1500)ml</td>
<td>3</td>
<td>3</td>
<td>19.00 ±5.831</td>
</tr>
<tr>
<td></td>
<td>(1525-2000)ml</td>
<td>2</td>
<td>2</td>
<td>16.03 ±3.486</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ventilator Modes</th>
<th>No.</th>
<th>%</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMV</td>
<td>66</td>
<td>66</td>
<td>14.98 ±2.581</td>
</tr>
<tr>
<td>PS</td>
<td>29</td>
<td>29</td>
<td>17.03 ±3.343</td>
</tr>
<tr>
<td>CVM</td>
<td>5</td>
<td>5</td>
<td>24.00 ±3.082</td>
</tr>
</tbody>
</table>

Duration Of Intubation

<table>
<thead>
<tr>
<th>IABP requirement</th>
<th>No.</th>
<th>%</th>
<th>Mean ±SD</th>
</tr>
</thead>
</table>
| Cont...
Table 2. Association between Duration of Intubation and Postoperative Risk Factors among Cardiac Surgery Patients with Prolonged Mechanical Ventilation.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Yes</th>
<th>No</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reoperation For Bleeding</td>
<td>4</td>
<td>96</td>
<td>20.25 ± 5.909</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>90</td>
<td>10</td>
<td>15.89 ± 3.272</td>
</tr>
<tr>
<td>Reintubation</td>
<td>5</td>
<td>95</td>
<td>22.50 ± 4.950</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>95</td>
<td>95</td>
<td>15.90 ± 3.357</td>
</tr>
<tr>
<td>Atrial Arrhythmia</td>
<td>17</td>
<td>83</td>
<td>15.82 ± 2.942</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>83</td>
<td>83</td>
<td>16.07 ± 3.601</td>
</tr>
<tr>
<td>Ventricular Arrhythmia</td>
<td>3</td>
<td>97</td>
<td>19.90 ± 3.033</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>97</td>
<td>97</td>
<td>15.90 ± 3.489</td>
</tr>
<tr>
<td>Renal Disorder</td>
<td>9</td>
<td>91</td>
<td>16.78 ± 5.167</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>91</td>
<td>91</td>
<td>15.96 ± 3.306</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
<td>99</td>
<td>26.00 ± 0.000</td>
</tr>
<tr>
<td>Duration Of Intubation</td>
<td>99</td>
<td>99</td>
<td>15.93 ± 3.354</td>
</tr>
</tbody>
</table>

CONCLUSION

From the result we can conclude, that the quantity of bleeding, reoperation for bleeding, reintubation, ventricular arrhythmia, stroke and infection seem to be strongly associated with delayed tracheal extubation contributing to patients for prolonged mechanical ventilation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Community Health Nursing Department, College of Nursing/ University of Misan and all experiments were carried out in accordance with approved guidelines.

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3. Mageed N, El-Ghoniemy Y. is renal dysfunctiona risk factors in patient undergoing cardiac surgery?: mansuorh cardiac unit experiences, iournal of


Prescribing Pattern of Antibiotics for Children after Admission in Pediatric Ward in Tikrit Teaching Hospital

Mohammed Nabhan Yaseen1, Ashoor R Sarhat1, Sarab K Abedalrahman2
1College of Medicine-Tikrit University, Iraq, 2Salah Aldeen Health Directorate, Iraq

ABSTRACT

Antibiotic were commonly prescribed drugs in pediatrics. However the threat of antibiotic resistance among children is cause for concern. A cross sectional hospital based study of the administration patterns of antibiotics after admission was carried out on children admitted to pediatric ward of Tikrit Teaching Hospital from first of March to the first of June 2014 selected by simple random role. The G. E was the most prevalent diagnosis among children 103, 68.6%, pneumonia 31, 20.8%, and the rest were with different diagnoses 16 cases 10.6% (including UTI, meningitis, otitis media and encephalitis). About 30 cases, 20 % of children were prescribed antibiotic by mother 19, 12 .6 % by G.P and about 101, 67.3 % were given antibiotic prescribed by specialist doctor. Most 47 , 31.3 % given children were given mixed oral and injectable antibiotic, 96 , 64 % were given one coarse of injectable antibiotic only and 7 , 4.6 % given than one course of antibiotic. Cephalosporin’s 107 , 71.3 %, penicillines 23 , 15.3 %, erthromycin 13, 8.0 % and rifadine only in 7 cases , 4.6% were found to be the most frequently used antibiotic.

Keywords: Prescribing Pattern of Antibiotics in Pediatric Ward in Tikrit, Prescribing Pattern of Antibiotics in Children.

INTRODUCTION

Many surveys during the past decades have demonstrated that more than half of antimicrobial use in hospitals is inappropriate 1. The major issue in promoting rational antimicrobial use is the growing concern about antimicrobial resistance and patient safety 2. Appropriate antimicrobial drug use is defined as the use that maximizes therapeutic impact while minimizing toxicity and development of resistance. It means prescribing an antimicrobial only when it is beneficial to the patient, targeting therapy to the desired pathogen, and using the appropriate drug, in optimal dose and duration1,4. It have been previously reported on the results of a survey assessing the necessity of antimicrobial drug prescribing at the Department of Medicine at the University Hospital Rijeka by using a point scoring system as a key quality indicator4. We found that as much as one third of all antimicrobials were prescribed to patients without clear indications. As a sequele to that we now report on the quality of antimicrobial drug prescribing by assessing the appropriateness of its use in the same study population.5

Infants and children are among the most vulnerable population groups that contract illnesses. The use of antimicrobial agents has become a routine practice for the treatment of pediatric illnesses 1,2 and antibiotics are among the most commonly prescribed drugs in pediatrics. Although the key role played by antibiotics in the treatment of infectious diseases in developing countries should be acknowledged, there are reports of irrational use of antibiotics3,4 which may even lead to infections that are worse than those caused originally. Pediatricians and other medical personnel who provide health care for infants and children in developing countries are faced with numerous challenges due to the shortage of appropriate drugs, costs and lack of infrastructure. The rising incidence of bacterial resistance to commonly used antibiotics, particularly the emergence of multi-drug resistant organisms has made it mandatory that antibiotics are used judiciously in pediatric practice. Many of the antibiotics are unnecessarily prescribed for viral infections such as the common cold. It has been reported that 20-50% of antimicrobial usage is
questionable or inappropriate. Several professional societies have issued guidelines designed to reduce the use of antibiotics worldwide by means of various control strategies. The aim of the study is to decrease mortality and morbidity among children by judicious use of antibiotic prescription after admission.

MATERIALS AND METHOD

Administration and ethical consideration: a survey was to be carried out on the parents or guardians of 150 children admitted to Pediatric ward at Tikrit Teaching Hospital. Socio-demographic characteristic: the study has been conducted in pediatric ward at Tikrit Teaching Hospital from different residence group [rural and urban].

The design of study: the current study work represent a cross sectional hospital based descriptive study. The selection of patients was by simple random role. The development of questionnaire in regard to gender (male and female), age (divided into 3 groups below one year, between one and five years, and above five years). Residence (rural and urban). Basic demographic information and details of the prescribed antibiotics, given anti biotic or not and their prescribing patterns, number of antibiotic, mode of antibiotic administration.

Number of courses of antibiotic, prescription of antibiotic by mother, GP, or consultant, clinical presentation, hospital diagnosis, and condition of child on discharge.

Data was analyzed using the statistical package for social sciences (SPSS) computer software program. The data collection the study includes two components; interview administration of questionnaire and examination clinically without laboratory finding. Prior to the interview, the purpose of study and data collection was explained and consent was obtained. The mother of child were interviewed and examined on pediatric consultant room of Tikrit Teaching Hospital. Intravenous fluid, blood transfusion and nutritional preparation were not included in the study. Clinical examination: any child selected were examined clinically regarding [fever, cough, vomiting diarrhea] and type of antibiotic given and its rate of administration. Follow up of patient admitted. Child admitted to the pediatric ward of Tikrit Teaching Hospital were followed for improvement by improvement in systemic symptoms, patient who do not examined back for assessment of improvement was excluded. The data were put in tables and figures and analyzed using the Chi-square method depending on the P-value. P-value less than 0.005 considered significant.

RESULTS AND DISCUSSION

The total No. of cases were 150 cases admitted to the pediatric word during the study period. Of the 150 children surveyed all were given Anti – Biotic after admission to the hospital (100%). The number of male patients were 91, 60.6 % comparatively more than the number of female patients, 59 cases, 39.3%. About 85, 65.6 % of the children were come from urban area and 65, 34.3 % come from rural area. Fever was the most prevalent clinical presentations 55 (36.7%) followed by diarrhea 34 (22.7%), vomiting 33 cases (22%), dyspnea 33 (22%), dysurs 12 (8%) and irritability 8 cases (5.3%) as shown in table 1. The G.E was the most prevalent diagnosis among children 103, 68.6%, pneumonia 31, 20.8%, and the rest were with different diagnoses 16cases, 10.6% (including UTI, meningitis, otitis media and encephalitis) as shown in table 2. About 30 cases, 20 % of children were prescribed antibiotic by mother 19, 12 .6 % by G.P and about 101, 67.3 % were given antibiotic prescribed by specialist doctor (table 3). About 47, 31.3 % given children were given mixed oral and injectable antibiotic, 96, 64 % were given one course of injectable antibiotic only and 7 , 4.6 % given than one course of antibiotic. Cephalosporin’s 107, 71.3 %, penicillines 23 , 15.3 %, erthromycin 13, 8.0 % and rifadine orally 7 cases, 4.6% were found to be the most frequently used antibiotic as shown in table 4.

Ceftriaxon 73(65.4%) and cefipime 21 (19.6%) were found to be mostly used followed by penicillin group by which combination of ampicilline and cloxacillin was the most commonly used antibiotic 17 (73.9%) followed by ampicillin only 5 cases (21.7%) as shown in table 5. Most of the patients not improved after the first course of antibiotic or given combinations of oral and injectable antibiotics while most of patients with second course of antibiotics were improved as shown in table 6. The emergence, spread and selection of antibiotic-resistant bacteria is a threat to patient safety in hospitals because:

1. Infections with antibiotic-resistant bacteria result in increased patient morbidity and mortality, as well as increased hospital length of stay;
2. Antibiotic resistance frequently leads to a delay in appropriate antibiotic therapy;
3. Inappropriate or delayed antibiotic therapy in patients with severe infections is associated with worse patient outcomes and sometimes death. 6

Prevalence of antibiotic used.

Antibiotics were prescribed to all patients included in the study. This is much higher than other studies in other parts in the word 4. This is may be due the wrong rules that is used by the specialist in that every patient in the hospital should have injection to satisfy the patients, or may be due to that most of the patients admitted were tired patients that necessitate antibiotic cover before waiting the results of investigations. Patients who are hospitalized have a high probability of receiving an antibiotic 10 and 50% of all antibiotic use in hospitals can be inappropriate. Misuse of antibiotics in hospitals is one of the main factors driving development of antibiotic resistance 4.

1. Misuse of antibiotics can include any of the following 4:
   2. When antibiotics are prescribed unnecessarily;
   3. When antibiotic administration is delayed in critically ill patients;
   4. When broad-spectrum antibiotics are used too generously, or when narrow-spectrum antibiotics are used incorrectly;
   5. When the dose of antibiotics is lower or higher than appropriate for the specific patient;
   6. When the duration of antibiotic treatment is too short or too long;
   7. When antibiotic treatment is not streamlined according to microbiological culture data results.

Age distribution:

Most of the study cases were below one year. This is goes with many other studies 8 in that most admissions were at this age groups. This may be due to the fact that this age group was the most target group for diseases as immune system was immature at this age group

Sex distributions:

Most of the study cases were males. This is goes with other studies 8 which show that most of the admission were males. This is may be due to the fact that families were more concern at our culture to males than females or may be due to difference in sample size.

Residence distribution:

Most of the cases were from urban areas. This is does not goes with other studies 9 which shows that most of the cases admitted were from rural areas. This may be due to that urban patients were near the hospital in that their admission were easier than those from rural areas which is far from hospital.

Clinical diagnosis:

Gastro enteritis was the commonest admission diagnosis followed by pneumonia. This is goes with many other studies in the nearby countries 9. This due to the fact that GE is the most cause for admission to hospital due to the poor sanitation and poor water purification system.

Madison WI – November 12, 2012 - When a parent has to take his or her child to the doctor for a bad cold, a sore throat, or a suspected ear or sinus infection, it is natural for that parent to make sure that some action is taken to address the illness. All too often, that need for action takes the form of requesting an antibiotic. 10 Using an antibiotic in situations where they are not effective can cause the bacteria targeted by this medicine to develop resistance that results in disease-causing bacteria that are harder to kill. Many serious bacterial illnesses are becoming harder to treat, requiring stronger and stronger medicines and/or combinations of medications. Some diseases have developed strains that are almost totally untreatable and other diseases that were considered under control are now reemerging as a public health challenge. Examples include drug-resistant tuberculosis and gonorrhea 11. Another challenge is the widespread use of antibiotics in farm animals. Several studies suggest the misuse of antibiotics by large-scale farming operations may be aggravating the widespread expansion of disease resistant bacteria. While this problem has been largely eliminated in European Union countries, the United States continues to lag behind. People concerned with this problem can explore such possibilities as buying meat from organic – antibiotic free producers as well as urging their elected representatives to support appropriate regulation of these practices 12.
Rote of antibiotics:

Most of the patients were received antibiotics by injection and little have oral antibiotics in addition. This is due to the fact that most of the admitted children were tired that difficult to give them the treatment orally which necessitate to give antibiotics by injection 13.

The reason why some antibiotics used is that some infections responded only to some oral antibiotics like erythromycin.

Types of antibiotics used:

Cephalosporines were the commonest antibiotics used followed by penicillin groups. This may be due to that cephalosporines work on wide spectrum of gram positive and gram negative bacteria and may be due to that cephalosporines can be give as single or twice daily than that of pencillines that should be given every 6 hours 15.

Measures to promote prudent use of antibiotics include 16

- Continuous education of prescribers and specialists included in comprehensive hospital strategies2;
- Evidence-based hospital antibiotic guidelines and policies2, 17;
- Monitoring of hospital antibiotic resistance and antibiotic use data to guide empiric antibiotic therapy in severely ill patients16;
- Administering the correct timing and optimal duration of antibiotic prophylaxis for surgery15;
- For some indications, using shorter rather than longer duration of treatment;
- Taking microbiological samples before initiating empiric antibiotic therapy, monitoring culture results and streamlining antibiotic treatment based on the culture results

Subgroups of antibiotics:

Ceftriaxone was the commonest antibiotics used is that due to its wide spectrum of work against bacteria and it can be given as single dose so called the outpatient therapy. The most common penicillin group was the combination of ampicillin and cloxacillin and the frequent use of it is due to the same reason above.

10. Response to blind treatment:

<table>
<thead>
<tr>
<th>Presentation</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>55</td>
<td>36.7</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>34</td>
<td>22.7</td>
</tr>
<tr>
<td>Vomiting</td>
<td>33</td>
<td>22</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>33</td>
<td>22</td>
</tr>
<tr>
<td>Dysuria</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Irritability</td>
<td>8</td>
<td>5.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>103</td>
<td>68.6</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>31</td>
<td>20.8</td>
</tr>
<tr>
<td>Others</td>
<td>16</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who give antibiotics</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>GP</td>
<td>19</td>
<td>12.6</td>
</tr>
<tr>
<td>Specialist doctor</td>
<td>101</td>
<td>67.3</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of antibiotics</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cephalosporines</td>
<td>107</td>
<td>71.3</td>
</tr>
<tr>
<td>Pencillins</td>
<td>23</td>
<td>15.3</td>
</tr>
<tr>
<td>Erythromycines</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Rifadin</td>
<td>7</td>
<td>4.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>
### Table 5. Distribution of cases to the subgroups of antibiotics used.

<table>
<thead>
<tr>
<th>Type of antibiotics</th>
<th>No.</th>
<th>Subtype</th>
<th>No (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cephalosporines</td>
<td>107</td>
<td>Cefotaxime</td>
<td>13(12.2)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceftriaxone</td>
<td>73(65.4%)</td>
<td>&gt;0.05*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cefepime</td>
<td>21(19.6%)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Pencillins</td>
<td>23</td>
<td>Ampicillin and cloxacilin</td>
<td>17(73.9%)</td>
<td>&gt;0.05*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ampicillin</td>
<td>5(21.7%)</td>
<td>&lt;0.05*</td>
</tr>
</tbody>
</table>

### Table 6. Distribution of cases in regard weather improved or not.

<table>
<thead>
<tr>
<th>Route of antibiotics</th>
<th>Improved</th>
<th>Not improved</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed oral and injectable</td>
<td>8(17%)</td>
<td>39(83%)</td>
<td>47(100%)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>First course</td>
<td>16(16.7%)</td>
<td>80(83.3%)</td>
<td>96(100%)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Second course</td>
<td>6(85.7%)</td>
<td>1(14.3%)</td>
<td>7(100%)</td>
<td>&gt;0.05*</td>
</tr>
<tr>
<td>Total</td>
<td>30(20%)</td>
<td>120(80%)</td>
<td>150(100%)</td>
<td></td>
</tr>
</tbody>
</table>

### CONCLUSION

The study concluded that there were a great misuse of antibiotics after admission to hospital as there were little improvement in the patient’s condition after blind use of antibiotics.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Medicine-Tikrit University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Relationship between Red Meat Consumption and Increase the Risk of Adulthood Breast Cancer

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ABSTRACT

The paper covers a broad concept adulthood intake of red meat and high breast cancer risk. Therefore, to critically examine the overall connection between breast cancer risks and the red meat intake, a combination of electronic data sources including the academic journals, e-books and preliminary literature reviews related to the selected topic were identified and used in the overall study. Besides, the discussion centered on the connection between consumption of large quantities of red meat and breast cancers were also evaluated from the print sources and the medhubs. The analyses revealed uncertain outcomes between the two variables and detailed results were compiled using the finding of the literature review and data sources. Based on the results of the overall research, the study presented evidence-based arguments that there is a close relationship between intake of high red meat quantities and the risk of getting breast cancer. Graphical representation of the historical trends in breast cancer tumors and eating red meat across the United States have also been included the in the midst of the research.

Keywords: Research Methodology, Preliminary Literature Review

INTRODUCTION

Historically, the total number of adults existing with breast cancer continues to exponentially increase in both the developing and developed countries due to old age and consumption of red meat. Currently, cancer risks in the US are approximately 38% for women and 41% for men. Between 2006 and 2012, statistics show that the survival rates were 67% which was a significant increase from 49% between 1975 and 1977. Additionally, 62% of the total number of adults aged 65 years and above survived cancer cases in the US. Personal health activities after treatment such as appropriate diets, maintenance of optimum weight and regular physical activities have significantly reduced cancer risks. This has also increased survival rates and sustenance of well-being and good health. Studies show that breast cancer in adults is mainly caused by excessive use of red meat which increases the accumulation of fats in the body. Therefore, improved survival rates for cancer patients can be increased by average physical exercises, low-fat content, appropriate body weight and high levels of fiber content in the diet. Evidence revealed that issues of weight gain, obesity and high chances for recurrence after treatment lead to high mortality rates. Healthy lifestyles also help breast cancer patients cope with symptoms arising after treatment, maintain physiological body functioning, reduce chances for diabetes and heart diseases and psycho-social well-being. Although Interventions and original breast cancer diagnosis help recent patients to show immediate recovery, findings indicate that long-term cancer patients do not maintain good feeding habits. Therefore, breast cancer patients are likely to look for guidance on appropriate strategies to cope with the cancer situation and prevent recurrence. The main reason that makes cancer patients not to recover immediately is the lack of established procedures to change dietary needs. Therefore, this essay seeks to elaborate on how red meat increases risks of breast cancer, possible feeding habits that help to mitigate breast cancer and significant health behavior change strategies. Objectives of this research were critically examine the association between cases of breast cancer and red meat consumption. To analyze
typically predisposed a heightened risk of suffering from breast cancer across the United States. To outline the critical breast cancer risk factors and its relationship with eating red meat.

**MATERIALS AND METHOD**

The research will adopt the use of quantitative study design including both the primary and secondary data sources. The primary data sources will comprise of sampling techniques, interviews, feasibility studies, surveys and administration of questionnaires to the target population (women across the United States) \(^9\). In this context, such sampling methods random sampling, cluster sampling and stratified sampling will primarily be used to gather a wide range of information from multiple regions across the United States \(^3\). In addition to sampling and other primary data sources, secondary data sources such as the use of the academic journals, magazines, classical scholarly websites, electronic books and the contemporary literature review regarding the relationship between cancer of breast and red meat consumption will be evaluated to come with more reliable healthcare data.

**RESULTS AND DISCUSSION**

Anderson et al. (2018) performed a systematic review to scrutinize the association between increased rates of cancer of breast and eating red meat. To achieve the set objective, the scholars generated an eligibility list consisting of women aged between 25-40 years. Based on the study results, the scholars articulated that both the processed meat and red meat species actively played a key role in predisposing breast cancer \(^8\). The results were supported by the fact that the red meat contained high levels of heme iron, giving estrogen to cattle and the multiple forms of mutagens formed through the process of cooking. On the other hand, Cho et al. 2017 conducted meta-analyses to assess the menace factors of breast cancer with special emphasis on the red meat. In this context, the scholars assessed connotation between eating red meat and heightened cases of cancer of breast among the premenopausal women aged between twenty-six to thirty-nine years across the United States. The results from the study documented that more than 1021 instances of breast cancer were identified in the sampled population. Referencing from the study results, it is evidential that higher levels of red meat intake typically predisposed a heightened risk of suffering from breast cancer (ER+/ PR+) among the premenopausal women across the United States \(^9\). The scholars finally concluded that a continuous eating of treated and red meat predisposed the risk of suffering from obesity which, in turn, increases the chances of breast cancer attack among the ageing women. As per the information collected from the literature review, online journals and academic websites present conflicting views regarding the relationship between consuming high red meat quantities and cancer of breast. Although some of the systematic reviews indicate that there are no significant impacts of red meat on increased instances of breast cancer, multiple meta-analyses indicate that women who consume high quantities of meat, particularly during their early adulthood, had an outstanding risk of 30-40% of being attacked by breast cancer \(^11\). The association between the two variables (breast cancer and red meat intake) was seen to persist after the women shifted to consumption of heme iron and fats from animals’ body. Further, the relationship was found to be intensified positive cancer tumors (ER&PR) \(^10\). Several biological mechanisms could typically be used to elaborate the relationship between cancer of breast and intake of high quantities of red meat. For instance, the heterocyclic amines which are created when red meat is induced to high temperatures during cooking are believed to be vitro and play critical part in the formation of breast cancer tissues. The contemporary reviews and cohort studies have found that the persisted eating of cooked red meat is scientifically proven to heighten the risk of suffering from breast tumors. Based on the control experiment conducted in the United States, regular use of fried meat was found to have a positive relationship with breast cancer while the other types meat were found to have no significant risks of breast cancer\(^13\). The second mechanism that has previously been used to survey the connection in between red meat eating and breast cancer is based on hormone contents in the meat. For instance, the red meat obtained from cattle has continually been associated with the exogenous growth hormones which have been found to have negative implications for human health. Further, evidence-based studies have confirmed that iron contained in the red meat predisposes women to risk of suffering from breast cancer. In this context, dietary iron has been found to produce estrogen carcinogenicity, particularly on rodents possibly through the promotion of free radical damage to the DNA \(^14\). Based on the literature review and other data sources, it was ascertained...
that heightened consumption percentage of red meat heightens the chances of being attacked by breast cancer tumors. The reviewed journals, epidemiological studies and clinical data have strongly supported that there is always an affirmative connection between red meat eating and ER+/PR+ breast cancer tumors among the premenopausal women across the United States. Based on the epidemiological studies and their respective end results, it is evidential to note that the incidence rate for estrogen receptor positive (ER+) cancer tumors were found to have significantly increased from relatively higher percentage of 65.2% (per one hundred thousand person-years) at the beginning of 1992 to exceptionally high rate of 75% at the beginning of 1998 fiscal year. In this context, the increasing trends were found to be directly linked to continuous eating of red meat particularly that from cattle. The contemporary studies evaluating the link between the risk factors attached to hormones and increased rates of breast tumors of cancer among the premenopausal women do support that the receptor-positive tumors differ in terms of etiology from the receptor-negative. Similarly, the study findings have disclosed that dietary predisposing factors have different effects of breast cancers which are always characterized by hormone receptor status. Through the comprehensive analyses conducted in this research, the findings show that most of the journals do not evaluate high quantities of some types of breast cancer and red meat based on tumor hormone-receptor status. Typically, some elements of red meat which include and not limited to heterocyclic residues in cooked meat, exogenous hormone and remains of heme iron have been found to influence the occurrence of breast cancer through hormone receptors positively. Therefore, the previewed journals reveal that it plausible that intake of high quantities of red meat is directly related to hormone receptor-positive cancer tumors. Based on the findings obtained from the online journals, the study revealed that several factors such increased rates of reproduction and ionizing radiations which primarily occur during the early and middle adulthood, high intake of red meat was found to have stronger impacts on the development of breast cancer in the later phases of growth. In the similar context healthcare journals articulated that there a positive correlation between increased risks of breast cancer and the high intake of animal fats. Furthermore, the systematic review conducted using medium examined the current trend in cases of breast cancer among the middle-aged women and its risk factors. The results from the systematic review indicate that about 300 instances of breast cancer were directly linked to middle-aged women who had been taking high quantities of red meat particularly during their high-school life.

CONCLUSION

In brief, breast cancer as portrayed in the entire research work has become a global issue tormenting many individuals. As a result, many people have lost their lives after a prolonged period of ailing as well as incurring high expenses in an attempt to seek treatment. The breast cancer can only be cured during its early stages and, thus, people need regular health check-ups so that when diagnosed they find a medication with immediate effect. Moreover, measures ought to be underway to encounter the predicament before it embeds itself deeply into the society. Red meat as depicted by the research is the leading factor associated with this deadly disease. Nevertheless, obesity, gender as well as the age to some extent contributes to the problem. However, the consumption of red meat cannot be compared to the other aspects as it has enormously caused cancer in many cases. According to the study results, eating of red meat leads to increased accumulation of fats as well as coming into contact with hormones responsible for conducting breast cancer. Thus, enhancing balanced diet can significantly aid in eradicating the problem. As per the research findings, food with a high composition of fiber is highly recommended to take and, hence, avoid adverse repercussions associated with an unbalanced diet. Moreover, physical exercises play a significant role in one’s health status. Consequently, they assist in preventing the malady in our context and bearing in mind that prevention is better than cure, they should be embraced in each individuals’ lifestyle. Nonetheless, the women with high breast density according to the research work has become a global issue tormenting many individuals. As a result, many people have lost their lives after a prolonged period of ailing as well as incurring high expenses in an attempt to seek treatment.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Public Health, Maysan Health Department, Maysan governorate, Iraq and all experiments were carried out in accordance with.

Conflict of Interest : None to declare.
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REFERENCES


The Efficacy of (SmartBrain Technologies) in Reducing the Attention Deficit Disorder (ADD) of the Primary School Students

Muhammad Sadie Saleh Al-Jashamy¹, Emad Hussein Al-Morshedi¹
¹Faculty of Basic Education, University Babylon, Hillah City, Iraq

ABSTRACT

The research aims to identify the efficacy of (Smart Brain Technologies) in reducing the distraction of the primary school students' attention. The researcher depends on the empirical method that has a pre and a post-test with one group. The sample of the research consists of eight students and before the application of the program, the ADD (attention deficit disorder) rating scales have been used by the researcher to identify the scope of the ADD of the students. Then, the program is applied in which it is formed by a set of video games and a set of video clips as DVD and it takes (30) sessions, whereat, the brain waves theta is reduced and beta is raised. After finishing the implementation of the program, the researcher applies the rating scales on the sample to identify the changes that happen after and before the implementation, whereas, the data is processed statistically by the Wilcoxon signed-rank test. The results show the efficacy of the SmartBrain Technologies in reducing the attention deficit disorder (ADD) of the students of the research’s sample.

Keyword: Attention deficit disorder, Efficacy, Smart Brain.

INTRODUCTION

The attention process is considered as one of the cognitive processes in which it represents one of the supports or even it is the base in which other cognitive processes depend on. We can even say that without the attention, a person cannot perceive, remember, invent or imagine things ¹,². Also, without the attention, the two processes sensation and perception and whatever cognitive processes follow them that end up to the learning will not happen. Hence, if a distraction or a confusion in the attention happens, it will lead to the reduction of the educational level in the learning materials that have connection to the reading, writing and other skills. The attention deficit disorder is regarded as having so many negative effects. It has become a problem for parents and teachers and whoever deals with these children inside the family or in school. Especially, in case the treatment idles, this disorder leads to academic, behavioral, emotional and social problems. Therefore, it is necessary to highlight the group of children who suffer from this disorder ³. Currently, human communities are in the orbit of change and development that is required by the most needs and information in this century of technology. And the result of man following the wheel of recent scientific progress is to make the most extent possible use of these data. Hence, all forms and kinds of technology become a basic requirement of all the other ones of this century and a feature for it. We can feel the impact of this distinctive feature of the age in every field of life especially the education field as it is the most or even the essential one in life and the most influential and affected by the change and development caused by the technological revolution. That is because the education field is an integrated system, designed to make the ordinary man interacting with his environment for the best ². This is the aim of technology in general yet maybe it is suitable for more than one category of many in a community. Technology has helped and is still helping the process of improvement of educational curriculums and programs especially the individual learning. Programmed education, computerized

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education, online education and other examples of the uniqueness of education have evolved tremendously with the development of technology and the use of it in education. The electroencephalogram (EEG) measures and monitors the electrical activity of the brainwaves which associated with various mental states, such as attention deficit, hyperactivity and etc., through a set of EEG sensors that bind tightly on the specific areas of the examinee’s head. The brain generates a set of brain waves which represent the rhythm of the nerves and called the four primary wavelengths (Delta, Theta, Alpha, Beta).

Slow brain waves are activated by Neurofeedback so that mental performance increases and the person is able to improve attention, memory and emotional and behavioral control. Increasingly, the attention has been paid to this technique as a result of the increasing number of people with ADD which according to the American Psychiatric Association is one of the most common disorders that usually continues to develop during adolescence and even to adulthood. Some of the manifestations of this type of disorder are impulsive, hyperactivity and the lack of attention. Recently it has been seen the increase in the number of people with this disorder which in the USA has reached the epidemic dimensions after it has increased over 25% in the last 10 years. As recent researches have shown that 3% to 7% of school children are diagnosed with the attention deficit disorder. Dr. Domenic Greco, the founder of SmartBrain Technologies, declares the effectiveness of the Neurofeedback training techniques which combines the advanced Neurofeedback technology with the video games. He claims that the treatment of children and adults who are diagnosed as having ADD with non-pharmacological and other psychosocial treatments is more effective in relieving long-term symptoms with no side effects and allows the individuals to live a normal life. As he points out that the technique also works to improve attention, creativity, imagination and the ability of learning in an interactive and enjoyable way. This technique helps children and adults to make the most of their abilities in various areas including health, education and performance enhancement. This technology has been a great surprise to parents who have believed of video games and watching movies as just a waste of time and they will turn their children to indolences. While CyberLearning Technology bets that playing video games helps in reducing the distraction of the children’s attention and therefore has developed a product called SmartBrain Technologies at which the usage of video games is a new matter in curing the attention’s problems of the children. These games rely on Neurofeedback which tracks and measures the brain activity, where Dominique Greco, the founder and chief executive officer of CyberLearning Technology, says that the brain produces slow brain waves and produces rapid waves patterns as well. When we are in the state of attention and consciousness, we produce quick and moderate brain waves but in the daydreaming state, we produce slow brain waves and when there is a real sleepiness, these waves are slower after that the person enters the sleep state. The opposite occurs when the child gradually wakes up or becomes conscious. This technique makes the individual aware of these changes in the brainwaves which leads them to find more ways to reach the state of attention and awareness.

Research Methodology and Its Procedures

This part shows the procedures that are done for achieving the research aims as the research approach, the empirical design, selecting the research community and its sample, preparing the research requirements and tools and presenting the statistical means that are used. The nature of the research requires an empirical approach meaning that the way the researcher adjusts all the variables that affect a phenomenon except for the experimental variable (the independent) in order to measure its effect on the phenomenon (the dependent variable).

The Research Empirical Design

It includes a single independent variable which is the SmartBrain Technologies and a dependent variable (the attention deficit). The empirical design is the search for a specific method for distributing the processors on the empirical units so that we can get the least possible error. It is also can be the plan that the researcher prepares in which by it he can answer the research’s questions. Therefore, the researcher uses the empirical design method that has a pre and a post-test with one group.

Preparing the Research Scale Instructions

The instructions propose is to explain the idea of the scale in its simplest form in order to facilitate the application of the scale because the clear and understandable instructions contribute in raising the coefficients of the scale validity, stability and objectivity.
In order to rely on the scale, its psychometric features must be extracted and they are as follow:

**Scale Validity**

The validity and the construction veracity of the test have been verified. The results show that the face validity achieved a 80 percentage of agreement among the arbitrators and specialists as for the validity of the construction, the results show that all the items of the scale are statistically significant, so the scale is valid in measuring the attention deficit.

**Stability of the Scale**

The estimation of the stability is considered as a feature of a good scale, although validity is more important than that because the valid scale is stable. Yet, it is not a stable scale of measurement though having homogeneous items if it measures a feature rather than the required one that the scale is prepared for. Two methods are found for achieving the stability of the scale and they are the split-half method and the Cronbach method.

**The split-half method**

This method basically depends on splitting into two equal halves (individual items and even items) to calculate the coefficients of stability of the scale and calculate the correlation coefficients between the two halves. The correlation coefficient between the two halves is the half-scale stability coefficient. Thus, the produced coefficients are corrected by the Spearman-Brown equation. Answer sheets of the sample members of the established scale measurement which are 100 sheets are used for finding the coefficient of the stability attention scale. After sorting the single items from the even ones, the Pearson correlation coefficient was calculated between the two halves of the scale which becomes 0.70. After correcting it with Spearman-Brown equation, the stability value becomes 0.82.

**The Cronbach’s alpha method**

The Cronbach’s alpha equation is often used to calculate the stability of psychometric tests that depends on the variation of the grades of individuals on the scales measurement items. The Cronbach’s alpha’s coefficient is used because it, in most situations, provides us with a good estimate which it depends on how far is the stability of the performance of the examinee on the scale’s situations. In this way, the extracted stability coefficient for the current research reaches 0.86 which is regarded as a high stability coefficient. The measurement is internally regarded consistent because this equation reflects the consistency of the items internally and the stability indicators of the attention scale are acceptable and good ones.

**The Prepared Program According to SmartBrain Technologies**

The sessions of the program are prepared according to SmartBrain Technologies where consist of 30 sessions and the time of each session is one hour. The researcher uses a set of video games, 6 games, and a set of video clips, DVDs, as these games change from time to time. The technology consists of a helmet, sensors built into the helmet to monitor brain activity, the Smart Box which receives brain signals. As long as the child remains calm and focused on the currant task, he or she performs normally at which receives feedback either in the form of a sound or a nice picture. If his attention is distracted from the game or the film, the Smart Box sends a signal to the control unit or the film displayer to block acceleration or the movement of the game character, as the system monitors the activity of the brain continuously during the game using the electrical brain signals (EEG). Intentionally, the researcher reduces the high waves of theta in students and raises the beta waves and the low SMR waves.

**Statistical methods used**

The researcher uses the Wilkinson test to compare the pre- and post-test scores of the attention deficit scale.

**RESULTS AND DISCUSSION**

After the researcher selects the sample and applies the attention deficit scale on it, he applies the program on the selected sample. The attention deficit scale is applied on the sample before the application of the technique (the program) and after it. The researcher uses the Wilkinson test to identify the differences between the pre- and the post-test as in the table 1. From the above table, the results show that the calculated value is 1 which is less than the scale value that is 2 at the level that its value is 0.05. This indicates that there are differences between the grades of students before and after the application of the program in favor of the post-test.
Differences between the Pre- and the Post-Test Scores

In addition, the researcher uses the (McGogian) equation to extract the program effectiveness impact size between the pre- and the post-test, and table 2 shows that. The above table shows that the effectiveness size value is 0.77 which is a suitable value for interpreting the effectiveness size. As Roebuck (1973) points out that the value of the impact size should be greater than 0.60 for the program to be effective 9.

Interpreting the Results

Current research results indicate the effectiveness of the program that is used to reduce attention deficit among the elementary fourth grade students. As the results of the study show that the attention deficit of the students who are exposed to the program reduces since the level of attention significantly increases in comparing to what was before the application of the program. The researcher attributes this to the fact that the S.B.T technique used in the research is able to reduce the attention deficit of the students (research sample). This indicates that the program has a positive effect in reducing the attention deficit which represents the increase of the suitable response in the class and the remarkably occurrence of the attention state. This is what the teachers of students point out by answering the scale items of the attention deficit after the application of the program in the post-test. These statistically indicated differences show the program’s effectiveness in reducing attention deficit. The technique of S.B.T depends on Neurofeedback since studies indicate the effectiveness of Neurofeedback in the treatment of many disorders, especially attention deficit one. Neurofeedback relies on the recognized way in which the brain responds to procedural signs. The reward (auditory and visually) is used as a reaction to the electrical state which represents the active and the lethargy of the brain and a positive or a negative reward is given accordingly. Neurofeedback has a long history with attention deficit disorder (ADD) in which there is a significant effect for the given reward by the technology to the students for their right performance as it drives them to increase their attention period. The results of studies in this field show that the brain is able to change itself. Thus, Neurofeedback is strengthening the ability of the self-changing brain to correct the nerve conditions that causing the disorder, as well as the results continue while having no serious side effects on the learner.

Table 1. It shows a comparison of the scores of the pre- and the post-test on the attention deficit scale

<table>
<thead>
<tr>
<th>The Least Frequent Reference Order</th>
<th>Rank Differences Signal</th>
<th>Rank Differences</th>
<th>Absolute Differences</th>
<th>Differences</th>
<th>Post-test Scores</th>
<th>Pre-test Scores</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) = 1</td>
<td>2,5</td>
<td>2,5</td>
<td>42</td>
<td>42</td>
<td>92</td>
<td>134</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4,5</td>
<td>4,5</td>
<td>44</td>
<td>44</td>
<td>93</td>
<td>137</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>7</td>
<td>48</td>
<td>48</td>
<td>93</td>
<td>141</td>
<td>3</td>
</tr>
<tr>
<td>(-) = 1</td>
<td>2,5</td>
<td>2,5</td>
<td>42</td>
<td>42</td>
<td>102</td>
<td>144</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4,5</td>
<td>4,5</td>
<td>44</td>
<td>44</td>
<td>95</td>
<td>139</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8</td>
<td>50</td>
<td>50</td>
<td>94</td>
<td>144</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>-1</td>
<td>136</td>
<td>135</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6</td>
<td>46</td>
<td>46</td>
<td>92</td>
<td>138</td>
<td>8</td>
</tr>
</tbody>
</table>

= T 1 (-) = 1 and ( + ) = 35
Table 2. Program Effectiveness Impact Size

<table>
<thead>
<tr>
<th>Effectiveness Size Value</th>
<th>Highest Score in the Scale</th>
<th>Post-test Scores Average</th>
<th>Pre-test Scores Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.77</td>
<td>180</td>
<td>99.625</td>
<td>139</td>
</tr>
</tbody>
</table>

**CONCLUSION**

Level of achievement increases whenever there are modern teaching methods. The use of disputed education has had a significant impact on increasing student achievement compared to the usual way. It was the use of education Almtmazaa significant impact in increasing the lateral thinking of the students in the experimental group skills compared to the usual way.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Faculty of Basic Education, University Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

Impact of Distinctive Education Strategy on Fourth Students Achievements in Physics

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ABSTRACT

The research aimed at identifying the impact of the distinctive education strategy in the achievement of students in the fourth class in physics. The researcher adopted the experimental research method as a methodology for conducting his research. It included an independent variable (the differentiated education strategy, the usual method) and a dependent variable. In order to obtain accurate and objective results in the following variables (the first course, the age of the month calculated by the months, the IQ test), before the application of the experiment equivalence, the researcher applied research tools to the two groups of the research. After correcting the students’ answers, the researcher obtained the data of the two research groups. The data were statistically processed by (t –test) The results showed that the experimental group which was studied according to the differentiated education strategy, was superior to the control group which was studied in the normal way in the scholastic achievement variable.

Keywords: Differentiated Education Strategy, Achievement, Fourth Grade Students, Physics.

INTRODUCTION

Education in general and science education are witnessing a great interest in the Arab and international countries there is a continuous development towards the best to keep pace with the characteristics of the scientific and technical age and the requirements of the twenty-first century and its challenges in the future. It is a continuous development movement to raise and improve the level and outputs of education and its quality in various types of education, Modern education has to keep up with the tremendous developments that happened in all aspects of life, so the teacher is no longer just a teacher but a learner of knowledge, the learner has an important role in the process of education and learning, and the teacher became organizer and guide of those processes. The concept of teaching refers to the intended process and the organization through which the elements of the educational process (teacher, learner, curriculum) interact, which are carried out in accordance with scientific procedures planned for it and seeks to achieve desired goals and objectives in individuals. The important aspects through which the objectives of the educational system are achieved and to achieve the objectives of the learners must be paid attention to modern methods and methods of teaching. The teaching of physics today has witnessed the use of different methods and techniques that provide learners with the means of learning that suit their abilities and speed of learning, whether learning individually or in groups. This helps to improve their skills for a better understanding of concepts. The emotional aspects that occur during the learning process play an important role in guiding the behavior of learners, especially at this age, which recently resulted in a lot of strategies and methods of modern teaching the educational process has become the Emphasizes on learning of the learner by himself through active participation rather than relying on the teacher. One of these strategies is the distinctive education strategy, which is a tool for teaching the scientific material. This type of strategy raises the capacity of the teacher and Learners and move them towards research, investigation, observation of behavior and the ability to measure. The use of this type
of education is to raise the levels of all learners in the classroom all of them and not only focused on the weak learners.

**METHODODOLOGY**

The researcher followed the experimental method, and the experimental is the researcher’s interest to ensure the impact it leaves on a set of independent variables on another set of dependent variables. The current study includes one independent variable (distinct education strategy) and a dependent variable. Therefore, the researcher selects in this study a partial experimental design of two groups, the experimental group and a post-test control group. As in Table (1). The research society consists of students of the fourth class in the governmental schools of the General Directorate of Education in Babylon province for the academic year (2017-2018). The number of the students is not less than four divisions. In order to apply the current research experience, and after the researcher chose (junior high school) to apply the experiment, he found that it consists of four divisions of the fourth class (A, B, C, D), the researcher chose Division D in the random drawing method to represent the experimental group and the number of students (33) which will the students will be learrned in accordance with the Education distinctive Strategy ), the same way the researcher chose randomly Division (b) to represent the control group and the number of students (33 ) which students will be learrned according to (the usual way). The researcher made sure to equal between the experimental and control groups so that the results of the research is more honest. so the difference between the experimental group and control rutern to the independent variable and remove all variables that may affect the results of the experiment and those variables are (age calculated by months, first chorus grades, IQ test). And the results were shown in table 2. For the purpose of maintaining the integrity of the experiment, the researcher tried to control the non-experimental extraneous variables, as they are not controlled can lead to improper results since it is impossible to distinguish between the impact and the effect of the independent variable. Here some of these variables and how to adjust them: Accidents associated with the experience: Experience in the search did not experience any emergency accident that impedes its progress. Experimental Extinction: No case of interruption, abandonment, or transfer of any student were carried out throughout the experiment. Sample Selection: The two research groups were chosen by the method of intent and the equivalence of the two groups were checked. Maturity factor: Since the duration of the experiment is unified between the two research groups and the age of the students were convergent so the growth will return to the members of the two groups at the same level, so this factor has not affected the search. Impact of experimental procedures: The researcher worked to limit the effect of experimental procedures that may affect the dependent variable during the course of the experiment. For the purpose of applying the research, the researcher prepared some of the requirements, including: The scientific material (content): The scientific material that the researcher is teaching, has been determined for the students of the two research groups during the period of the experiment (the second semester) of the academic year (2017 - 2018) The last five chapters of the fourth grade physics book, The researcher then prepared the behavioral goals: Here the researcher based on Bloom classification of the cognitive field consisting of six major levels of difficulty (recall, understanding, application, analysis, synthesis, assessment). The number of teaching plans is (16) for the experimental group that is taught according to the differentiated education strategy and the same for the control group which is taught according to the usual method.

**Research Tool:** The steps of the research tool (the collection test) are:

**Determining the purpose of the achievement test:** The requirements of applying the current research are to prepare an achievement test that is used to measure the academic achievement of the research sample in physics. Therefore, the researcher has prepared an achievement test related to the studied subject and related behavioural purposes in accordance with the level of the research sample.

**Determination of the purpose of the test:** The objective of the test is to measure the achievement of students in the fourth grade scientific (research sample) in the chapters (sixth,seventh, eighth, ninth, tenth) of the book physics after teaching them.

**Determining the number of test paragraphs:** The researcher determined the number of paragraphs that constitute the test of achievement as the number of paragraphs of the test.

**Preparation of the test map**
The researcher prepared the specification table according to its basic steps, where he determined the relative importance of the five chapters (light, reflection and refraction of light, mirrors, thin lenses, static electricity), and determined the relative weights of each level. In the light of the number of pages of the book chapters, after determining the paragraphs of the test with (40) paragraph, the number of questions per cell was calculated in the specification table.

The formulation of the test paragraphs: After the preparation of the specification table, the researcher prepared (40) objective test results of the type of multiple choice with four alternatives to measure the level (knowledge, understanding, application, analysis, synthesis and evaluation) and the five topics of the book Physics, Reflection and refraction of light, mirrors, thin lenses, electrostatic).

Formulation of the test instructions: The researcher prepared instructions for the test of the collection, including how to answer (choosing one correct alternative to the paragraph, answering all paragraphs, the time period for answering, writing the triple name, the class and the division in the assigned space).

Correcting the test answers: After the test paragraphs were formulated and the test type was selected, a standard was established to correct the answers. It was developed (one score for each correct test paragraph) and (0) for the wrong answer and the unanswered paragraph that the student did not answer. Therefore, collective is (40 marks) and minimum (0).

The validity of the test: The veracity of the test was verified and the validity of the content was confirmed. The results showed that the virtual honesty is (80%) obtained a percentage of agreement by the arbitrators and specialists. As for the validity of the content, the results showed that all the test subjects were statistically significant. Measuring the comprehension of students in the fourth class in physics.

The pilot application of the test of achievement: It was in two phases

The first test application for the test of achievement: To clarify the clarity of the paragraphs and the instructions of the answer and to determine the test time, the test was applied to a sample of (40) students of the fourth class non-research sample to calculate the time taken to answer the test paragraphs through the calculation of the average (The first student and the last student). The average time required to answer the test scores was (18.5 minutes) and the test clauses were clear and the test instructions were understandable and there was no ambiguity.

The second pilot application for the test of achievement: The test was applied to a sample of (100) students of the fourth class non-research sample, the purpose of which is to analyze the statistical achievement test paragraphs represented by the coefficient of paragraph difficulty.

Statistical analysis of the test scores: The test scores were analyzed as follows:

The difficulty factor of the paragraph: By conducting statistical analysis of the terms of the test of achievement, it was found that the coefficient of difficulty of the paragraphs ranged from (0.20 — 0.80), so the test scores are appropriate in terms of difficulty and ease.

The coefficient of distinguishing the paragraph: The important qualities that must be provided in the paragraphs of the test is the characteristic of discrimination and means the possibility of items or paragraphs to identify the individual differences of students and the test items are valid as the coefficient of discrimination items (0.25) and above the value of the coefficient of the test achievement is between(0.33 — 0.52) and with this the subjects of the achievement test have a good and appropriate discrimination coefficient.

Effectiveness of the wrong alternatives: The researcher conducted a statistical analysis (highest 27% and lowest 27%) degree to find the effectiveness of the wrong alternatives ranging from (-0.3 — 0.26) and it turned out that the alternatives of the test paragraphs are all effective and thus the collection of all appropriate.

The stability of the test: depends on the relationship between each paragraph or between all test paragraphs. The test paragraphs have a clear meaning that must be both true and consistent. Stability indicates that the test scores are identical when they are returned again, i.e., indicates the balance and stability of the students’ grades in the test was found by method of half-fragmentation: This method is one of the most used methods, because it avoids the disadvantages of some other methods and
in order to obtain two images of the test. The researcher divided the paragraphs of the test into individual and marital paragraphs and choose the answers of students sample, which are (100) answers. Pearson correlation between the scores of individual and conjugated vertebrates was obtained by the coefficient of constancy and its value was (0.75). Since the indexation stability coefficient of the test does not measure the total homogeneity of the test (because it is only half constant), the correction was done using the Spearman Bruen coefficient, (0.88) which is a good coefficient of stability from the point of view of specialists.

**Application of the research tool:** The experimental and control groups were informed of the date of application of the test, one week before it was carried out, and it was applied after the completion of teaching the specific material for the two research groups at one time.

**Statistical methods:** The researcher used the t-test equation for two independent end-points to make the equivalence between the experimental and control groups in the following variables: (the age of time calculated in months, the achievement of students in half the year in physics, intelligence test).

**RESULTS AND DISCUSSION**

The results showed that the students of the experimental group who studied according to the differentiated education strategy are better than the control group students who studied according to the usual method in the achievement test and this agrees with the studies that confirmed the superiority of the experimental group which was studied according to the differentiated education strategy on the control group which studied according to the usual method, as confirmed by previous studies.

**Table 1. Experimental Design for the Research.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Independent variable</th>
<th>The dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Differentiated Education Strategy</td>
<td>Achievement</td>
</tr>
<tr>
<td>Control</td>
<td>The usual method</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. The (t-test) results of two independent groups samples of the research (age calculated in months, first course grades in Physics, IQ test)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Arithmetic mean</th>
<th>Variance</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculated</td>
<td>166.82</td>
<td>91.23</td>
<td>64</td>
<td>0.776</td>
<td>Not statistically Significant</td>
</tr>
<tr>
<td></td>
<td>in months</td>
<td>165.82</td>
<td>29.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>First course</td>
<td>63.73</td>
<td>191.82</td>
<td>64</td>
<td>0.548</td>
<td>Not statistically Significant</td>
</tr>
<tr>
<td></td>
<td>Grades</td>
<td>65.64</td>
<td>208.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intelligence</td>
<td>33.12</td>
<td>35.88</td>
<td>64</td>
<td>0.884</td>
<td>Not statistically Significant</td>
</tr>
<tr>
<td></td>
<td>test</td>
<td>31.88</td>
<td>28.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 3. Arithmetical mean, standard deviation, variance, T calculated value, tabular values of experimental and control groups scores in the achievement test.**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Group</th>
<th>Number</th>
<th>Arithmetic mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Degree of Freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>33</td>
<td>12.28</td>
<td>17.5</td>
<td>26.73</td>
<td>64</td>
<td>4.359</td>
<td>Not statistically Significant</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>33</td>
<td>22.18</td>
<td>5.88</td>
<td>34.57</td>
<td></td>
<td>2.000</td>
<td></td>
</tr>
</tbody>
</table>
**CONCLUSION**

Using of a differentiated learning strategy has helped students to do different activities according to their abilities, aptitudes and learn according to their own potential. Using of a differentiated learning strategy has resulted diversification in the presentation of content and the use of more style and activity during the lesson has made the classroom interesting and renewable, away from stagnation and boredom.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of the Modified (M.U.R.D.E.R.) Strategy in the Achievement for the Fourth Grade Science in Physics

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¹College of Basic Education, University of Babylon, Hillah City, Iraq

ABSTRACT

This research aims to knowing the impact of the modified (M.U.R.D.E.R.) strategy in the achievement for the fourth stage science in Physics, the researcher has used the experiment method to make his research that contains independent variables (modified Murder strategy, the usual classical method), a dependent variable (Academic achievement). The researcher used the experimental design with partial adjustment to adjust variables of the research, the researcher has made a parity before starts applying the experience between the two research groups to get accurate and substantive results in the following variables (the first course degree, age by months and intelligence (IQ) test), the results showed that the experimental group that has been studied according to modified Murder strategy was superior to the control group which has been studied according to the usual way in the variable of the academic achievement.

Keywords: Modified Murder strategy, the achievement, The Fourth Grade Science, Physics.

INTRODUCTION

Scientific education emphasizes creating a conscious person who has the ability to face this knowledge and technological development, the future challenges, economic, social, scientific culture and able to keep up the modern life, that means the scientific education is a continuous process, the scientific education has a great role in building the human community through the completely formed of human so that he is not only more knowledge, but more mature, growing and able to thinking, it works to prepare a student who has a degree of knowledge and awareness of general scientific matters that concerning in all aspects of life so as to be able to face the situations in a variable community so as to achieve all the aspects of his/her personality, therefore, it’s necessary to emphasize the scientific education in the science curriculum of any educational system, one of the science curriculum is physics that has a great role in variable and scientific development that has encouraged the attention of educators who included by development and update concerning in content, teaching methods and teaching aids, hence, teachers have to choose methods, strategies and teaching methods which are intended to reach the aim in educational programs, the selection of these things depend on the suitability of the students’ characteristics, needs, the nature of the academic content, educational aims and the available financial and human means, one of the modern strategies is the modified M.U.R.D.E.R strategy, that activate the role of the students and makes them the focus of the educational process, thus prepare educated generations not a recipient generations, in additional to the mental and social skills, values and positive attitudes which is necessary when dealing with the educational system to recognize the effect and effectiveness of its aspects, through this strategy, the student can see the subjects comprehensively, that makes the student capable of criticism and creativity, that confirms this kind of strategies is comprehensive, so the student who is thinking in this strategy will acquiring multiple levels of thinking, as we see that murder strategy is one of the cognitive strategies which has been used in science that has proved its importance in the recrystallization of ideas, details, reasoning and distinction between the views and facts and how understand the information and how get information to the absorption and make links within

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the learned material with previous information, murder strategy works on increase the students’ achievement, the achievement is one of the aims that the educational process seeks to achieve in its various shapes because of its importance in the life of the student, it is the only criterion in the educational field through that it is possible to judge the transfer of the students from one educational class to another and from another stage of study, then distribution them in the various fields of education, and help them in improving the teaching methods, and base for most of the educational decisions, face the problems and decision-making. The cognitive strategies are the most learned abilities affecting effectiveness of human education of its inputs and intentions, cognitive psychologists have become increasingly interested in cognitive strategies because of the important role that it plays in learning, remembering, thinking and solve problems, the process of learning this strategy becomes a productive and effective employment for many researchers and scientists of cognitive psychology especially under the large learning systems, this strategies need to be acquired and it is natural to keep up with studies and research about the cognitive strategies, according to (Alzayat) that the characteristics of the strategies used in the information processing, Chevron Watkinson (1969, 1971) presented models for the information processing system and components, it’s also the short term and long term memory that forms the basic components of most contemporary models of information processing systems, also Anderson (1980), Bauer and Helgard (1981), these determinants or components (sensory memory), short term memory and long term memory that are not seen as separate components or separate structures, it also doesn’t represent physiological structures brain but it has seen as faces or determinants in order to sequester processing, in the same way the flow information is not seen through these determinants, faces or components as an actual transition can be observed from one component to another.

Physics in Medicine

International Organization of Medical Physics – IOMP which has founded in 1963, is a scientific and educational institution with membership of 75 countries and more than 16000 members: The United States of America: American Association of Physicists in Medicine – AAPM and The American Board of Radiology - ABR

METHODOLOGY

Design of the experimental research

This research includes one independent variable (modified M.U.R.D.E.R strategy) and a dependent variable (collection), the researcher had been chosen in this study (experimental design) to the partial adjustment of two groups one of them is the experimental group and the other the control group that has a post-test for collection.

Identify the research community and choose a sample

The research community included students of the fourth grade science in the government schools which belong to the education in Babylon, the academic year (2017-2018), there are two sections, the researcher has chosen a sample (Alkeni preparatory school for boys), purposely to apply the experience of this research, he has found that it has three sections for the fourth grade science, (A,B,C) the researcher has chosen (B) in randomly to represent the experimental group, the number of its students (38) that will be studied according to Modified M.U.R.D.E.R strategy, in the same way, the researcher had chosen section (A) randomly, to represent the control group (37) students that will study its students according to the usual method.

Statistical analysis of the achievement test items:

the achievement test items had been analyzed as follows:

Coefficient of items difficult: conduct statistical analysis of the achievement test items they found out that its Coefficient of items difficult between (0.33-0.69) so the achievement test items are consider suitable in difficulty and ease.

Coefficient of items discrimination: one of the important qualities to be provided in the test items is distinction property that means The possibility of items to identify individual differences of the students and the test items are valid as the coefficient of discrimination of items is (0.33 - 0.52) and more, the value of the coefficient of discrimination in the achievement test items between (0.20 - 0.80) Thus, the subjects of the achievement test items are characterized by good and appropriate discrimination.

Effectiveness of the wrong alternatives: The researcher conducted a statistical analysis (highest 27%
and lowest 27%) to find the effectiveness of the wrong alternatives ranging from (0.07, 0-3). As a result, the substitutions of the achieve

Stability of the test: The stability coefficient of the test depends on the relationship between each item or between all the test items, all effective therefore all considered suitable. and this is evidenced by the stability of degrees and consistency of items, and can calculate the coefficient of stability of the test using the legal relationship between the test units, It is a good test to be consistent and accurate. The test items must have a clear meaning. It must be both true and consistent. Stability indicates that the achievement test items are identical when they are returned again, that is, it indicates the balance and stability of the students’ grades in the test.

Methods of finding the stability of the test

Koder - Richardson Method 20 This method is one of the most widely used methods, due to the fact that it avoids the disadvantages of some other methods. In order to obtain two equal images of the test, The researcher divided the test items into individual and marital items and selected the responses of the sample of the survey sample (100) , And Pearson correlation coefficient between the grades of individual and marital items was obtained coefficient of stability and the amount (0.78) , Since the half-stability coefficient of the test does not measure the overall homogeneity of the test (because it is only half stable) , Therefore, the correction was used by the Spearman Bruan’s coefficient (0.88) that is a good stability coefficient from the point of view of the specialists.

Applying the research instrument: The two research groups were informed of the date of applying of the test, one week before it was completed, it was applied after the completion of teaching the specific subjects for the two research groups at one time. The researcher supervised the applying of the test. The experimental group that has been studied according to modified Murder strategy was superior to the control group which has been studied according to the usual method, that agrees with the studies which emphasized that The experimental group that has been studied according to modified Murder strategy was superior to the control group which has been studied according to the usual method, and the previous studies emphasized that. Table (1) shows that.

Table 1. The experimental and the control groups in the achievement test in physics

<table>
<thead>
<tr>
<th>Statistical Group</th>
<th>sample size</th>
<th>Arithmetic average</th>
<th>Standard deviation</th>
<th>Degree of freedom</th>
<th>The T-two values</th>
<th>Indication level (0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>34</td>
<td>80.36</td>
<td>12.6</td>
<td>68</td>
<td>2.000</td>
<td>0.460     statistical</td>
</tr>
<tr>
<td>Control</td>
<td>36</td>
<td>12.29</td>
<td>56.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

Through that the research findings the researcher find out these procedures: Teaching students of the fourth grade science according to modified M.U.R.D.E.R strategy has a positive effect in raising their academic achievement. Teaching according to modified M.U.R.D.E.R strategy increased the ability of learners to organize information and relationships to achieve the form of interdependence and functional integration and it’s used to solve the daily problems.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of the Strategy of the Overlapping Waves in the Development of Mental Reasoning Skills of Students

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ABSTRACT

The aim of the research was to identify the effectiveness of the strategy of the overlapping waves in the development of the mental reasoning skills of the students. The researcher adopted the empirical research method as a methodology for its research procedures, which includes an independent variable (the strategy of overlapping waves, the normal method) and a dependent variable Experimental design with partial control to adjust the search variables. Prior to applying the experiment, the researcher was rewarded between the two research groups for the purpose of obtaining accurate and objective results with the following variables: After applying the experiment, the researcher applied his research tools to the two groups of research. After correcting the students' answers, the researcher obtained data for the experimental group and the control. Data were statistically tested by t-test for two independent samples. The results showed that the experimental group was better than the control group.

Key words: Strategy of overlapping waves, development of reasoning skills

INTRODUCTION

Education is an essential pillar in the building and individualization of the individual as it includes the types of activities that affect the individual and his preparations, behavior, mental orientation, intelligence and skills, and the effects on his personality, physical, mental and psychological dimensions. The modern view of education has become a dynamic process developed in line with modern scientific and technological developments, as the use of modern strategies was not accidental, but came in response to the needs of the educational system to achieve its objectives, so the modern education is continuous and permanent not specified by a certain period of time it includes the entire person from cradle to It is the result of the interaction, the positive and the activity of the individual. As a result of this interaction, the personality of the individual grows and logical reasoning becomes accustomed. The curriculum became based on important pillars of the book (teacher, student, teaching methods, methods, educational techniques), and any development that takes place in the curriculum must be influenced by its staff. Therefore, new strategies and methods of teaching have emerged, which have shifted the educational process from the subject of study and dependence on the teacher to an educational process that concerned the student, who in this case is a center of organized activities that seeks to achieve the objectives of the educational process. The strategy is an integrated plan in which the teacher organizes his work inside the classroom, with a variety of students, or between the students themselves, and allocates the time to be part of it, educationally, the other interactively, and another part of the calendar. And emphasizes the importance of teaching strategies in that they relate to all aspects that help the occurrence of learning, including teaching methods, and to stimulate motivation and investment of the learner, and taking into account the readiness of learners and their tendencies and the availability of learning environment appropriate so it is the path that leads to achieve the goal, The teacher, for the purpose of achieving the
goals of the curriculum, so that every action or action has an end or purpose? Among the new strategies is the strategy of the overlapping waves, a strategy in which the student develops his own knowledge and relies on the student’s intelligence and mental skills and psychological preparations, as a result of his experience many lead to the construction of self-knowledge in his mind, that the pattern of knowledge depends on the same person, the learner builds and adjusts his knowledge build On the data of new knowledge, and learning is better and characterized by continuous and continuous development, but the content of education comes in the form of real tasks and problems have a connection to the lives of students and their reality, which stems from their position in a real problem, seeking to find solutions in the Praise the search process, gather information about the problem, and suggest solutions. General mental ability expresses the general intelligence, that is, this ability interferes in all mental activities, mental, intellectual and cognitive to varying degrees, the skills of reasoning is induction: induction, reasoning and conclusion, and can be briefly presented to identify each of these skills: Induction: It is defined as any cognitive activity that is characterized by the conclusion of the general rule of its particles. Elicitation: defined as the ability to appear in the mental performance characterized by the development of parts of the rule and is known as a process of thought and organization resulting in conclusions based on introductions or ideas and be true if they based on correct hypotheses, and the qualitative skills included in the development are the use of rules of logic, and the exploration of the conflicting statements, and analysis through the processes of logic, and solving spatial problems.

METHODOLODY

It includes an overview of the procedures that were carried out to achieve the research objectives, starting with the research methodology and experimental design, defining the research community and samples, the equivalence of the research groups (experimental and control), preparing the research requirements and tools, it includes a single independent variable (overlapping waves strategy) and a dependent variable (development of reasoning mental reasoning skills). Therefore, the researcher used experimental design with partial adjustment of two equal groups, one experimental and the other controlling.

Population & Sample of the Research

The current research population represents the average second grade students, all of them in the secondary and intermediate schools of the General Directorate of Education in the province of Babil (Hashimiya district) in the academic year 2017-2018, In which the average second-grade population is not less than two divisions. The researcher chose (intermediate Saif Al-Jabri) in the center of Al-Medhatiya, in Hashimiya district of Babil province, deliberately to conduct his research, who found that it includes two divisions of the second grade (A-B). In a random way, he chose (A) to represent the experimental group that contains (37) students who will study according to the strategy of overlapping waves. In the same way, the researcher randomly selected (B) to represent the control group and the number of its students were (34) students who will study according to the usual method.

The Equivalence of the Two Research Groups

The researcher conducted a statistical equivalence between the experimental and control groups in some variables that affect the results of an experiment, and to determine the selection of the equivalence researchers with the following change: (the age of time calculated in months, the grades of students in the first semester, Danley’s analysis of intelligence Table 1.

Preparation of Research Requirements

The research requirements are the basic elements on which the research is based and according to which the research procedures are implemented. These requirements are as follows: The scientific material (the content): The scientific material that the researcher is teaching has been determined for the students of the two research groups during the period of the experiment (the second semester) of the academic year (2017 - 2018). The scientific article included the last three chapters of the geography book for the second intermediate grade, Formulation of Behavioral Goals: The researcher formulated 120 behavioral goals based on the general objectives and the content of the material covered by the Bloom experiment in the cognitive field distributed among the first five levels of the Bloom classification (knowledge, understanding, application, analysis, composition) Teaching Plans: The researcher prepared a set of teaching plans for the experimental and control groups in light of the content of the last three chapters (3,
Define the purpose of the test to develop the skills of mental reasoning: reasoning thinking is a logical mental process that involves a set of sub-skills that appear in every cognitive activity characterized by extrapolating the base from its particles, and devising the part of the whole as the individual walks from known facts or issues of its validity to knowing the unknown mentally.

Identify test objectives: After determining the purpose of development of mental reasoning thinking skills test, the objectives of the test are determined to see how well they have been achieved and the researcher has formulated a number of behavioral goals.

Determine the test items: The researcher identified the number of items that consist of the test to develop the skills of mental reasoning as the number of items of the test (40 items).

Preparation of the table of specifications: The researcher prepared the table of specifications according to its basic steps, he determined the relative importance of the three chapters: (mineral wealth, population, continents of the New World), and also determined the relative weights of each level of the cognitive field in light the number of pages of the book’s chapters, After determining the items of the test with (40) items, the number of questions per cell was calculated in the specification table.

Extract the test items: The items of the test of development of mental reasoning skills in the initial form in light of what was included in the test map, The researcher chose the type of test (multiple choice) which is one of the best objective tests, the test consisted of (40) items, divided into five of Bloom’s cognitive levels (knowledge, understanding, application, analysis, composition), subjects on scientific material.

Test instructions: Specific instructions are written on how to answer (selecting one correct alternative to the item, answering all items for the duration of the answer, writing the full name, the grade and the division in the assigned space).

Correcting the test answers: After the test items have been drafted and the type of test selected, a standard has been established to correct the answers, (One degree for each correct test item, zero for the wrong answer, and the left item that the student did not answer, the item for which more than one choice was made). Thus, the maximum final score for the test of the development of mental reasoning skills is (40 degrees), The minimum score is (zero).

The validity of the test: the face and content validity of the test was confirmed. The results showed that the face validity obtained the agreement of (80%) by the arbitrators and specialists. As for the validity of the content, the results show that all the paragraphs of the test of the development of mental reasoning skills, so the test is true in measuring how students understand and absorb scientific material.

The exploratory application of the test of the development of mental reasoning skills: include what comes

The first exploratory application: The test of the development of mental reasoning skills in first exploratory phase was applied to a group of second-grade students from the non-research sample. The number of students was 30 students. The purpose of this test was to know the clarity of the instructions and the test instructions. And the calculation of the time required for the test. The researcher recorded the exit time for each student. In calculating the arithmetic mean of time, it was found that the time required to answer all the test paragraphs was (43) minutes.

The second exploratory application: The test was applied to a sample of (100) students in the second grade of non-research sample. The purpose of this test is to analyze the test items of the development of mental reasoning skills which are the difficulty of items, item distinction, the effectiveness of wrong alternatives.

Statistical analysis of test items for the development of reasoning mental skills: The test paragraphs were analyzed as follows:

Item difficulty: The statistical analysis of the test items found that the coefficient of difficulty of items ranged from (0.35 - 0.70). Thus, the test items of the development of mental reasoning skills are all good and
Reliability of the Test: it’s the relationship between the test items, which means the coefficient of test reliability depends on the relationship between each item or between all items of the test, this is illustrated by the stability of its degrees and consistency of its items, the reliability of the test coefficient can be calculated using the legal relationship between the test units. A good test specification should be consistent and accurate. To make the test items meaningful, they must be both true and consistent.

RESULTS AND DISCUSSION

The students of the experimental group who studied in accordance with the strategy of the overlapping waves exceeded the students of the control group who studied according to the usual method in the test of development of mental reasoning skills. Thus, the first zero hypothesis is rejected and the alternative zero hypothesis is accepted: there was a statistically significant difference at the level of (0.05) between the average score of the students of the experimental group studied according to the strategy of the overlapping waves and the average score of the control group students who study according to the usual method in the test of development of reasoning skills, and this agreed with the studies that confirmed the superiority of the experimental group that was studied according to the strategy of the overlapping waves on the control group studied according to the usual method.

Table 1. The arithmetic mean, the standard deviation, and the two values of the variable of the chronological age are calculated by the months, the first semester grades and the IQ test for the two research groups.

<table>
<thead>
<tr>
<th>variable</th>
<th>the group</th>
<th>Sample size</th>
<th>SMA</th>
<th>standard deviation</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age calculated in months</td>
<td>Experimental</td>
<td>37</td>
<td>22.55</td>
<td>46.56</td>
<td>66</td>
<td>0.456</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>38</td>
<td>23.7</td>
<td>50.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First semester grades</td>
<td>Experimental</td>
<td>37</td>
<td>64.989</td>
<td>14.8</td>
<td></td>
<td>0.320</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>38</td>
<td>66.17</td>
<td>13.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IQ test</td>
<td>Experimental</td>
<td>37</td>
<td>20.94</td>
<td>33.76</td>
<td>66</td>
<td>0.550</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>38</td>
<td>21.77</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

The strategy of overlapping waves have an effective positive effect to raise the scientific level of students in the scientific article compared to the usual way. The strategy of overlapping waves made the students the focus of the educational process and this led to the development of mental reasoning skills. The strategy of overlapping waves have a positive impact in raising the level of intelligence and sense of responsibility and increase the principle of self-confidence among students. The strategy of overlapping waves have a great impact in the development of mental reasoning skills students of the two groups of research

Financial Disclosure: Here is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Graduate Studies.
Methods of Teaching Socialities, College of Basic Education, Babylon University, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Influence of Hybrid Education Strategy on the Perception of Fifth Class Students (Biological Branch) in Chemistry Material

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ABSTRACT

The aim of the research is to know the influence of hybrid teaching strategy on the understanding of fifth class students –biological branch– in chemistry. The researcher has adopted the experimental research as a methodology to do their research which includes an independent variable (hybrid teaching strategy, the standard method) and a dependent variable (the educational achievement), as well as her reliance on the experimental design associated with partial setting so that he could control their research variables. They also made, before applying the experiment, equivalence between the two groups of the research so as to get accurate results pertaining the following variables: (first term marks, intelligence test, age). Then, the requirements of applying the experiment were prepared: aims, tests, and plans for both of the groups. After practicing the experiment and applying her research tools on the groups, the researcher obtained her data which was conducted calculably by means of (t-test) for two independent samples. The results showed the group of experiment superiority with the hybrid education over the other group which were taught according to the standard method.

Keywords: hybrid teaching, achievement, fifth biological class, chemistry

INTRODUCTION

The scientific education has witnessed a great deal of care and continuous growth so as to adjust to the contemporary scientific surge and its needs and that indeed is rooted on the nature and structure of knowledge for it is the cornerstone in the modern scientific education. Furthermore, it is essential that chemistry teachers should understand that for each branch of knowledge is its own characteristic ¹-⁹ and that we need such scientific education that creates an independent, aware, criticizing, revising, caring, sensitive, responsible and daring person whose imagination is vast enough to face the 21st century with its requirements and its future economic and social challenges ⁹; moreover, the purpose required is to acquaint the learner with information, traditions and scientific values as well as activating and making them scholarly, socially and physically educated people; i.e., teaching them the scientific truths and knowledge and to put them into practice in the scientific, social and kinetic fields ¹. Hence, teaching concept indicates the intentional and regulated process by which the teaching elements (teacher, learner and material) interact, and which is done according to pre-planned procedures aiming at fulfilling desirable destinations and ends. Teaching is considered to be very important to achieve the goals of both: the educational system and the learners, and that is why modern methods and techniques of teaching must take the due attention and care ⁸; as a matter of fact, that requires hard work and seeking the best methods, techniques and strategies which are harmonized with the environment, taking into account the class reaction, scientific content and educational activities ³. It is for no doubt that chemistry association with the fields of life such as medicine, industry, communication, information and universe has obliged the educational foundation to provide the learners with the demanding chemical notions which enable them to solve any issue they may
encounter in order to improve the type of life and make education functional for learners. Thus, the teachers are to acquaint with teaching strategies they should use, how and when to apply them, their matching to the material content and the learner’s level in total. Lately, a lot of modern strategies and methods of teaching has emerged concentrating on the learner as the center to the educational process rather than the content or the teacher himself, and thus what is stressed is that the learner has to depend on themselves through the active participation instead of relying on the teacher. Actually, one of the meant strategies is this of hybrid teaching which is considered to be integral of the usual techniques of education; information technology itself is not a goal at all, rather it is a means to deliver knowledge and to achieve the aims expected from education, besides it makes the student ready to confront the life needs. Consequently, the hybrid education is accompanied with the usual teaching to support it easily, quickly and clearly; actually, it will not be successful if it lacks in some fundamental elements available in the usual teaching.

Hybrid Education Strategy: It is the integral incorporation of: usual teaching and electronic teaching; educational inputs like behavioral, constructive and cognitive ones leading to improving the educational output and the educational technology along with instruments/ means in the environment of electronic education and usual education. One of the steps required to apply hybrid education is that the teacher should choose the subject; the suitable subject is an issue pertained to a concept not to a truth because it is usually relative to a lot of materials rather than to one topic – it may be a scientific concept to let the teacher determine the linked materials as sciences, maths, …etc; then the teacher is to detect the basic ties and skills required besides writing key points for the subject to be discussed and introducing the ideas and truths which are the basis of various scientific negotiations among learners. Then, the teacher will prepare questions, activities and drills that help students achieve their objectives; hence, they start choosing activities and collecting information about the subjects already given and the teacher thus will be fully familiar with the school curricular. Actually, it is recommended that the teacher should prepare the hybrid subject along with his colleagues who teach the same material in order to get agreeable skills.

Former Studies: (Nawras K. A. al-Juburi 2016) the aim of the research is to know the effect of using hybrid education on the achievement of second intermediate (female) students in biology material and their motivation towards it. The researcher chose the experimental material and design, of the partial setting; the sample was chosen randomly and composed of (77) female students from Babylon center; after handling the data calculably by (t-test) for two independent samples, the results showed the superiority of the experiment group students who had studied in light of hybrid teaching and accordingly the researcher put a number of recommendations and suggestions in order to do other researches and studies exploring the effect on other variables and stages.

MATERIALS AND METHODS

These include showing the procedures which were done to achieve the research objectives starting with its methodology and experimental design besides determining the research community and sample; the equivalence of the research two groups: the experimental group and the typical one; setting the research requirements and tools and finally the procedures of applying the experiment and showing means of calculation used, which are going to be shown as follows:

Research experimental design: includes the independent variable (hybrid teaching) and (normal method) as well as a dependent variable (achievement); so the researcher used the experimental design with the partial control of two equivalent groups one of which is experimental and the other is typical.

Research community and sample: which is represented by fifth class biological branch students all of whom are in schools (secondary and preparatory) which are morning and governmental schools belonging to the general directorate of education in Babylon province / city center in (2017-2018), where there are two fifth classes at least for biological branch. As far as the research sample is concerned, the researcher chose (Tulaitila preparatory school) on purpose to do her research to find four classes suitable for the test (A,B,C,D). She decided to choose class (A) in a random draw way to represent the experimental group whose number of students was (35) and they would be taught according to (hybrid teaching); in the same way, the researcher chose class (B) randomly to represent the
typical group whose number was (35) students who would be taught according to the (typical method). The two groups’ equivalence: whereby the researcher made calculable equivalence between the experimental and typical groups in regard to some variables which affect the trial test. Although the researcher had chosen the groups randomly besides that the research sample was from similar social and economic community to a great extent and from the same school, was serious enough to achieve equivalence in respect with the following variables: age (calculated in months), first course marks and intelligence test. The results then were shown as the table below depicts:

**Intrusive variables control:** despite investigating the equivalence between the research groups in regard to some variables which she thought that they might influence the experiment path, the researcher tried to circumvent the effect of a few intrusive variables which are mentioned below along with how to control them:

**Incidents accompanied:** the experiment was not exposed to any emergent situation or hindering incident.

**Experimental fragmentation:** no absence or transfer happened to any student throughout the experiment course

**Sample selecting:** the two groups were selected by the same intentional way and the equivalence between them was confirmed;

**Growth element:** since the duration of the experiment is identical for both of the groups and the ages of their students are almost the same, then the growth happening will bring back the same level for both; that is why there was no effect of this element on the research.

**Experimental procedures influence:** which the researcher did her best to avoid in order not to affect the dependent variable during doing the experiment.

**Research requirements setting:** The requirements are from the basic aspects which the research depends on and according to them the procedures are done; they are represented by:

**Scientific material/content:** which was determined by the researcher while she was doing the experiment (second term of the study year 2017-2018) – it included the last four chapters from chemistry book for fifth class – biology branch;

**Formulating behavioral objectives:** the researcher formulated (150) behavioral objectives depending on the public ones and the material content which the experiment included according to (Bloom classification) in the cognitive field distributed among the six levels of the said classification: (knowledge, understanding, application, analysis, composition and correction).

**Study plans:** which were prepared by the researcher for both of the experimental and typical groups in light of the content of the four chapters from chemistry book which was devoted to teaching the fifth class (biology branch) during 2017-2018; they were (16) plans for both the experimental group studying according to hybrid teaching and the typical group studying according to the standard method).

**Test stability:** whose factor depends on the relation between each item with the other or among them all; this is shown through marks stability and items harmony. This factor can be calculated by means of the regulation relation among test items; to be reliable and stable is a characteristic of a good test whose items must be clearly meaningful – stability indicates getting the same test results if it is done again; i.e, it refers to the balance and stability of students’ marks.

**Ways of finding test stability:**

**Halving method:** it is considered to be one of the most used methods because it circumvents other methods flaws; so in order to get two equivalent copies of the test, the researcher divided the test items into odd and even items, and by testing the students’ answers which were (100) ones belonging to the survey sample, and concluding person linkage factor between marks and items both odd and even ones, the stability factor obtained was (000000). Since halving factor for the test does not assess the whole harmony of the test (because it is stability for only one part), correction had been done by means of Spearman Brown factor which was (00000) being a good stability factor according to specialists.

**Coder-Richardson20 method:** Coder-Richardson equation was applied according to students’ marks to find that stability factor value was (000) which is good and suitable and consequently the test was stable too.

**Research instrument applying:** both of the experimental and typical groups were notified the time
of applying the achievement test a week beforehand and it was applied after finishing teaching the determined material for both of the groups at the same time, the researcher being supervising the test applying.

**Calculation instruments**: the researcher used (t-test) equation for two independent samples to fulfill equivalence between the experimental and typical groups in regard to the following variables: (age in months, mid-year achievement in chemistry material and intelligence test).

**RESULTS AND DISCUSSION**

Experimental group students who studied according to hybrid teaching won over those belonging to typical group who studied according to usual method in achievement test, which goes with those studies that had endorsed the experimental group prevalence studying in harmony with hybrid teaching, notably exceeding the results achieved by the typical one.

### Table 1. Sample size, Calculation average, Scale divergence and Function level

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Sample size</th>
<th>Calculation average</th>
<th>Scale divergence</th>
<th>Freedom degree</th>
<th>T value</th>
<th>Function level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in months</td>
<td>Experimental</td>
<td>37</td>
<td>208.51</td>
<td>9.97</td>
<td>71</td>
<td>0.084</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Typical</td>
<td>36</td>
<td>208.33</td>
<td>8.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First term marks</td>
<td>Experimental</td>
<td>37</td>
<td>61.59</td>
<td>15.6</td>
<td></td>
<td>0.084</td>
<td>2.000</td>
</tr>
<tr>
<td></td>
<td>Typical</td>
<td>36</td>
<td>60.5</td>
<td>17.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intelligence test</td>
<td>Experimental</td>
<td>37</td>
<td>36.92</td>
<td>8.19</td>
<td></td>
<td>0.084</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Typical</td>
<td>36</td>
<td>35.28</td>
<td>9.12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSION**

Level of achievement increases whenever there are modern teaching methods. Using of disputed education has had a significant impact on increasing student achievement compared to the usual way. It was the use of education Almtmazaa significant impact in increasing the lateral thinking of the students in the experimental group skills compared to the usual way.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

The Influence of Strategy of Instrumental Enrichment of Second Grade Students for Geography Material

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ABSTRACT

The current research aims at identifying the “effect of the strategy of Al-Wasili in the collection of geography among second-grade students.” The current study was conducted in Iraq / Babil governorate. The researcher chose the experimental method. The research community was the middle schools in Karbala Free. The researcher chose the students of the second grade the average sample of the research and the number of (70) students, two divisions distributed equally experimental group studied the strategy of rich and easy control group studied in the traditional way. The researcher rewarded between the two groups of research in some variables that affect the effect of the experiment and the results were that the two groups are statistically equivalent. The researcher used the statistical methods suitable for the research procedures (the independent testing of two independent samples, the square of Kai, the coefficient of ease and difficulty, the coefficient of discrimination, and the effectiveness of alternatives). The results of the study showed that there was a statistically significant difference at the level of significance (0.05), ie, the superiority of the experimental group on the control group in the achievement test.

Keywords: Vasiliy strategy, collection, geography.

INTRODUCTION

Our current era is characterized by scientific and technological revolution. This requires attention to the development of the abilities of learners and their potentials that help them to face current and future situations and problems if the human mind becomes the first investment of the developed countries. The most powerful countries are the ones that improve the investment of their children. And the technology that the world lives in this age, it seeks to nurture a productive learner equipped with the knowledge, skills and individual abilities that drive him to actively participate in the service of the society in which he lives and thus is the engine of all progress A process to be witnessed by the community, and in order to seek education to achieve its objectives, it is necessary to raise the process of helping to provide the learner with information and functional concepts and development of basic skills and practical trends and ways of thinking, which makes him able to understand the environment around him and to address the problems encountered, Education has witnessed a significant development during the past century. The shift from the focus on content has emerged as the primary goal for the learner and his idea, as the goal of education and its means. This has resulted in major changes in the roles and functions All institutions and tools used by education to implement their goals starting with the school and the teacher and the different methods, tools, methods and educational and educational methods ¹. The curriculum is one of the field of teaching geography has been renewed “in the methods, methods and modernization of means and tools. The movement of innovation has started from the perspective that has crystallized through reality and its strategies. It takes us to talk about the strategy of Wassili enrichment, which may be one of the most appropriate strategies that can be used in acquiring and developing skills. Problem solving and achievement in learners. The primary goal of the facilitative enrichment is to help learners learn and increase their ability to adapt to the
environment by changing their cognitive environment and imparting new cognitive skills. As measured by the many studies where the teacher teaches the information and knowledge to the students and clarifies the mysterious and summarizes them while the role of the student is specific activity and effectiveness by going to the conservation and without making the development of their thinking skills. The Vasili enrichment strategy is a classroom-based teaching procedure, and depends on the means of enrichment and provide the opportunity to choose what fits the content of the geography and the nature of the concepts, skills and events and aims to develop the ability to independent education and based on the assumptions that the intelligence is adjustable and not fixed, “and is directed to students in primary, Independent learning skills, free inquiry, research and reading, use of resources and books, and experimentation are used to transform teaching from information imparting to the development of learners’ mental skills and to use those skills to understand problems Present and future confronted and overcome.

**METHODOLOGY**

The researcher followed the steps of the experimental curriculum to identify: (the impact of the strategy of enrichment Wassili in the collection of geography in the second grade student’s average) because it is the appropriate approach to achieve the goal of research. Experimental Design: The researcher chose experimental design that is of great importance in experimental research because it ensures the researcher's proper structure and study the problem well. The experimental group is the group that presents its students to the independent variable (Wesley enrichment) and the control group: the group whose students are not exposed to the independent variable (the Wesley enrichment), but the traditional method, and the collection means: the dependent variable measured by a post-test. The independent variable in it, either the search tool, the post-test.

**The research community and its sample**

The current research community consisted of second grade students in intermediate schools and preparatory day schools for boys belonging to the General Directorate for the Education of the holy province of Karbala for the academic year (2017 2018), located within the free zone in the holy province of Karbala, Which will apply the experience, which is a friendly medium, The researcher, accompanied by the book of the Department of Education of Karbala Holy, found it consists of five people for the second grade average, and the method of random clouds selected researcher Division (B) to represent the experimental group, which will study the geography of the Arab world using (strategy Wassili enrichment). And (d) to represent the control group to study the same article in the traditional way, and the number of students in the two groups (70) students distributed equally to the two divisions, after the exclusion of the recruits of them (6) of the two divisions, where he became 35 students in the experimental group (35) A student in the control group and table (2) shows this. That the reason for exclusion of students who are rejected from the experience is that they have previous experience, and stay in the classroom to maintain the school system. The researcher was keen before starting the experiment on the equivalence of students of the two groups of research statistically in some variables that are believed to affect the safety of the experiment, although the sample students from one region, and the same gender and these variables are (age of students, Previous, IQ) as shown in Table (3).

**Determining the Scientific Material**

Before starting the experiment, Topics of geography book The Arab world to be taught by the Iraqi Ministry of Education edition (34 years 2016) m. For students in the second grade for the academic year (2018-2017) was the following: Chapter I - the Arab world (area, shape, borders, signed). Chapter II - Natural Characteristics (Terrain, Climate, Natural Plant, Water Resources). Chapter III Economic Life (Agriculture and Livestock), the first three chapters of the book geography of the Arab world. Behavioral objectives. The researcher formulated behavioral goals of (140) behavioral goals. Based on the general objectives prepared by a committee in the Ministry of Education in the Republic of Iraq, and the content of the subjects of the geography subject to be studied in the experiment, distributed at the four levels in the knowledge field of the Bloom classification (knowledge, understanding, application and analysis), Presented by the researcher to a group of experts specialized in geography and methods of teaching social, and educational and psychological sciences, and after analyzing the answers of experts before the researcher goals all, percentage (80%), of the corresponding experts. Thus, the number of behavioral goals in the final form (140) remained behavioral, (36) for behavior level, (30) for behavior level, (20) for behavior and (14) for
Numbers of the test map

Therefore, Test map numbers: The researcher prepared a test map of the topics to be studied in the experiment and the behavioral goals of the first four levels In the knowledge field of the Bloom classification. The weights of the subject content were calculated according to their concepts and according to The weights of the goals Depending on the number of behavioral objectives in each level according to the objectives of each subject to the total number of objectives, and the number of paragraphs of the test was determined by (50) Substantive paragraph (multiple choice) distributed on matrix cells of the specification table. As shown in Table (5).

Eligibility test

The researcher sets out instructions for the test of the achievement, including the objective of the test and the method of answering its verbs. The validity of the test is the most important characteristic among the characteristics of the good test. The test is true if it measures what is measured for it, ie if it achieves the purpose for which it was designed. And to make it meet the objectives for which it was developed, the researcher used the following Virtual honesty: The researcher verifies the veracity of the presentation of the paragraphs of the test of the collection of a group of experts and arbitrators in the methods of teaching social and educational sciences, psychological and geographical, to ensure the integrity of the paragraphs and their relevance for specific purposes and clarity of formulation and objectivity of alternatives and attractiveness, has been reformulated some paragraphs and modify them taking the views Experts, the proportion of agreement (80%): Thus, the number of test paragraphs in their final form (50) became a test paragraph and thus achieved the apparent truth. After the completion of teaching the subjects specified in the current research, the researcher identified the date of the test a week before the date of the test, so that students have sufficient time to review the material, The test was conducted in two adjacent and similar classrooms in the school, The researcher himself supervised the application of the test, using the instructor of the material on the test process to monitor the performance during the application of the test, and did not take the test what affects the course of his performance, after applying the test corrected the researcher answer papers, and gave one score for each correct answer and zero for each answer The total number of test subjects is (50) a paragraph . The researcher used the t-test for two independent samples to equalize the experimental and control groups in the variables (parental achievement, the age of time calculated in months, the grades of general geography in the first intermediate grade for the academic year 2016- 2017) Test results (post-achievement). As well as the Sebrman-Brown equation: was used to correct the correlation coefficient between the test halves (individual and marital vertebræ scores) after extraction with the Pearson correlation coefficient The equation of the coefficient of difficulty and ease and the test paragraph: was used to calculate the level of difficulty of each paragraph of the achievement test and the equation of discrimination of paragraphs and the effectiveness of the wrong alternatives. The researcher presented the results of the academic achievement for the purpose of verification of the validity of the zero hypothesis, which states that there is no significant difference at the level of significance(0,05) Between the average achievement of the students of the experimental group who studied geography using the previous Wesleyan enrichment strategy and the average achievement of the students of the control group who studied the same subject in the traditional way. After applying the achievement test to the students of the two research groups and correcting the answers, the mathematical mean and the standard deviation of the students’ scores were extracted. Using the T-test for two independent samples, the T value was created. It is clear that the difference D is statistically significant for the experimental group at a level of (0,05) and the degree of freedom (68). This indicates that there is a statistically significant difference between the results of the two groups of research in the achievement test and for the benefit of the experimental group. In light of this result, the null hypothesis that there is no statistically significant difference at the level of (0,05) The geography of the Arab world using the strategy of Wassili enrichment, and students of the control group who study the same material in the traditional way, This indicates that the strategy of Wassili enrichment had an effect on raising the level of students’ achievement in the geography of the Arab world. The effect size was (0.84). Through the current research results, the researcher can explain why the experimental group is superior to the control group Statistics for the following reasons.
The use of the Wassiliian Enrichment Strategy has had a positive impact on the increase in the achievement of second-graders in geography. There is a need for students in the intermediate stage in the geography of modern teaching strategies, including the strategy of easy enrichment. The reliance on this strategy enabled students to link the previous information with the new information they obtained.

Table 1. Shows the experimental design of the research.

<table>
<thead>
<tr>
<th>group</th>
<th>Independent variable</th>
<th>The dependent variable</th>
<th>the tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>The strategy of Wassili</td>
<td>Collection</td>
<td>Post-test</td>
</tr>
<tr>
<td>Control</td>
<td>traditional way</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Distribution of students of the research sample before and after the exclusion on the two research groups.

<table>
<thead>
<tr>
<th>group</th>
<th>Division</th>
<th>Number of students before exclusion</th>
<th>Number of students excluded</th>
<th>Number of students after exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>B</td>
<td>37</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>Control</td>
<td>D</td>
<td>39</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>76</td>
<td>6</td>
<td>70</td>
</tr>
</tbody>
</table>

Table 3. Equivalence of the two groups of variables (age, time of previous year, IQ test).

<table>
<thead>
<tr>
<th>group A Variables</th>
<th>Experimental (35) students</th>
<th>The officer (35) students</th>
<th>value T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The middle variance</td>
<td>The middle variance</td>
<td>Table calculated</td>
</tr>
<tr>
<td>chronological age</td>
<td>166,23</td>
<td>167,09</td>
<td>~ 0,689</td>
</tr>
<tr>
<td>The previous year marks the first average</td>
<td>65,91 66,97 103,02</td>
<td>123,21</td>
<td>2,000 At adgree of freedom 68 ~ 0,419</td>
</tr>
<tr>
<td>IQ degree</td>
<td>35,31 35,31</td>
<td>34,6 48,58</td>
<td>~ 0,46</td>
</tr>
</tbody>
</table>
### Table 4. Distribution of behavioral objectives on the chapters of the article.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Cognitive levels</th>
<th>Number of goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Analysis 14%</td>
<td>Behavior</td>
</tr>
<tr>
<td></td>
<td>Application 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Understanding 30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge 36%</td>
<td></td>
</tr>
<tr>
<td>Chapter one the Arab world</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Chapter two natural characteristics</td>
<td>11</td>
<td>77</td>
</tr>
<tr>
<td>Chapter three Economic life total</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>140</td>
</tr>
</tbody>
</table>

### Table 5. The specification table represents (test map)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Number Page</th>
<th>Relative importance</th>
<th>Cognitive levels</th>
<th>Number of goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Analysis 14%</td>
<td>Behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Application 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Understanding 30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Knowledge 36%</td>
<td></td>
</tr>
<tr>
<td>Chapter one the Arab world</td>
<td>9</td>
<td>13%</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Chapter two natural characteristics</td>
<td>38</td>
<td>55%</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Chapter three Economic life total</td>
<td>22</td>
<td>32%</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>100%</td>
<td>18</td>
<td>140</td>
</tr>
</tbody>
</table>

### Table 6. The meta-test of the two research groups is the achievement test.

<table>
<thead>
<tr>
<th>The group</th>
<th>Number of sample</th>
<th>Average calculation</th>
<th>Degree of freedom</th>
<th>T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Deviation</td>
<td>Calculated Table</td>
<td>Level of significance</td>
</tr>
<tr>
<td>Experimental</td>
<td>35</td>
<td>36.8</td>
<td>68</td>
<td>3.471</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
<td>32.4</td>
<td>68</td>
<td>4.77</td>
</tr>
</tbody>
</table>


CONCLUSION

In light of the result of this research from the following conclusions can be reached: The use of the Wassiliian Enrichment Strategy has had a positive impact on the increase in the achievement of second graders in the geography field. Reliance on this strategy has enabled students to link DIM with previous information with new information they have acquired.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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3. Al-Banna HA. Effectiveness of Wassili enrichment in the achievement and modification of patterns of cognitive preference for students with high learning difficulties in the preparatory stage, Journal of the Faculty of Education. 2002.
Assessment of Personal Hygiene Knowledge among Intermediate School’s Students at Al-Numaniya District in Wasit Governorate

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ABSTRACT

Background: Personal hygiene is an important international public health issue, it is linked with confirming good health to the human. A descriptive cross-sectional study was conducted throughout the period of (September 2017 to August 2018). It aimed to assess existing knowledge related to personal hygiene among intermediate school’s students at Al-Numaniya district in Wasit Governorate. As well as to determine the contributory factors affecting the knowledge of the personal hygiene among intermediate school’s students. Quantitative research design was utilized to conduct the study on the intermediate school’s students who are studied at (12) intermediate schools distributed throughout the Educational Directorate at Al-Numaniya District in Wasit Governorate. In which (468) students was selected by simple random sample technique. Through an extensive review of relevant literature, a questionnaire was constructed for the purpose of the study. Data collection process started from 25th of March 2018 to the 24th of April 2018 were analyzed by using of descriptive and inferential statistical analysis. Results of the study revealed that (78.8%) from intermediate school’s students had good knowledge and (21.2%) had fair knowledge while none of the students showed poor knowledge about personal hygiene.

Keywords: personal hygiene, Knowledge, Schools’ Students.

INTRODUCTION

Hygiene subjects include personal hygiene, which is well-defined as self-care requests that perform to preserve the school’s students on their well-being, which are hygiene is described as some appliance created and any sanitary protection perform to be protected from environments that can impairment our health, also personal hygiene is extremely essential for protecting and sustaining health and attending health problems and is also essential to the inhibition of various diseases, particularly infectious diseases¹. There are many common diseases that affect schools’ students are caused by lack of awareness and knowledge of personal hygiene, from these diseases are diarrheal diseases, skin illnesses, intestinal helminths and oral diseases are greatest commonly related with lack of their personal hygiene knowledge and practices ². In developing countries notable that where acute respiratory and intestinal infections are the primary causes of morbidity and mortality among school’s students, in which researchers described that (31%) and (62%) of all deaths in Southeast Asia and Africa among school’s students, in that order, are caused by communicable disease due to deprived personal hygiene and it is practices³. In addition, diarrheal morbidity is reduced to (44%) also respiratory infections can reduce to (23%) by hand washing with soap. Therefore, it is clearly obvious that the purpose of personal hygiene is not only to enhance the standards of personal cleanliness within the location of the condition where students live, but also to decrease the prevalence and incidence of infectious diseases⁴. Personal hygiene deficiency diseases have been found to remain to be a dangerous community health problem in some developing countries and people...
frequently affected particularly schools’ students. Throughout the adolescence stage, self-care activities convert more important as the body starts to mature and physiologic alterations start to occur. Hormonal changes in adolescent’s stage product in growing of pelvic and axillary hair in both sexes. Boys progress facial hair and may begin shaving. Sebaceous glands develop more functioning and often produce excess oil on the skin which lead to skin difficulties as acne and inflammation which are psychologically disturbing to the adolescent’s self-image. Sweat glands also develop fully functional and adolescents may requirement to use a deodorant or antiperspirant. This make clear the importance of daily bathing and shampooing to prevent body odor.

**MATERIALS AND METHOD**

A study aims at: To assess existing knowledge related to personal hygiene among intermediate school’s students at Al-Numaniya district in Wasit Governorate. As well as to determine the contributory factors affecting the knowledge of the personal hygiene among intermediate school’s students.

**Design of the study:** Quantitative research was used the descriptive type of cross sectional study design in which conducted on the intermediate school’s students at Al-Numaniya district in Wasit Governorate to assess students’ knowledge about personal hygiene.

**Sample of the study:** A simple random sample technique of (468) students which was selected from (12) intermediate schools distributed throughout the Educational Directorates at Al-Numaniya district in Wasit Governorate, which was selected randomly (39-40) students distributed on classes (1, 2, 3) from each school.

**Validity and Reliability:** The content validity of the instrument was established through a panel of (16) experts, the reliability of the items was based on the internal consistency of the checklist was assessed by calculating Cronbach s’ Alpha which as= 0.80.

**Statistical analysis:** Data are analyzed through the application of descriptive statistical data analysis approach that includes, frequencies, percentages, standard deviation. And inferential statistical data analysis approach that include Chi-squared test used to assess the relationship between overall knowledge about personal hygiene from one side and categorical variables from the other side. And used the Binary multiple logistic regression analysis to assess the contributory factors of knowledge the intermediate school students about personal hygiene.

**RESULTS AND DISCUSSION**

This table reveals that the study samples their ages were between (13 – 16) years and were almost equally distributed on these age groups. Male and females were equally distributed, in which (234) students of each gender. Almost two thirds (67%) of the students were had separated accommodation. Concerning parent’s education, results indicate that the (27.8%), (24.6%) of mothers and fathers respectively are graduated intermediate school. Regarding parent’s occupation appeared that governmental employees represented (51.7%) and (82.3%) of fathers and mothers respectively. The monthly income of the family was (400-600) thousands IQD in 218 (46.6%) students’ families. Where (56.8%) had good academic achievement. This table shows summary of the mean knowledge scores and assessment of students’ knowledge about the different domains of personal hygiene, in which higher knowledge score was reported for the domain about eyes hygiene with a mean overall knowledge score of (2.70). however, in all the domains students had good knowledge assessment except two with lower overall knowledge score had fair assessment were domain about skin hygiene and bathing and domain about nose hygiene, with mean score of (2.34, Fair) and (2.29, fair), respectively. This table revealed each of the following: Female gender, accommodation (separated), advanced father’s education, monthly income of the family > 800,000 IQD and good academic achievement were significantly associated with good knowledge of the students (P. value < 0.05). While age, school grade and mother’s education were insignificantly associated with knowledge of the intermediate schools’ students (P. value > 0.05). Results revealed that the study samples their ages were between (13 – 16) year and were almost equally distributed on these age groups. Male and females were equally distributed, in which (234) students of each gender. These results agreed with the results obtained by study of (Temitayo, 2016) who had studied knowledge of personal hygiene among secondary school student, in which (50.7%) of his study sample were males and (49.3%) were female, also majority of the respondents were between the ages of 12 - 17 year.
study showed almost two thirds of the students (67%) were having separated accommodation, this finding is supported with the study of (Arikan et al., 2014) that they studied the personal hygiene status among primary school students, that appear (63.9%) were nuclear family type and living separately and (36.1%) were large family type who were living with sharing. Concerning parent’s education, results of present study indicated that the (27.8%), (24.6%) of mothers and fathers respectively were graduated intermediate school that indicate the parents of study sample were well educated. These results are supported by the study of (Ansari and Warbhe, 2014) in that they studied assessment of knowledge regarding personal hygiene among school children, in which their finding indicated that most of the study sample were (34%), (36%) of mothers and father’s education respectively, were graduated from secondary school. Regarding occupational status results of current study indicated that most of the parent’s occupation were governmental employees represented by (51.7%) and (82.3%) of fathers and mothers respectively. This result concurrent with the study of (A Mohamed et al., 2016) in that they studied knowledge of hand hygiene among parents of preschool children where they found that most of parent’s occupations of were employment in the governmental sector was (56.7%). In addition to the study results, the present study found that most of intermediate school’s students families receiving were (400-600) thousands IQD monthly and account (46.6%) out total of the study sample. This result contradicted with (Beumer et al., 2008) study in that they studied state of personal hygiene among school students: A community-based cohort study. They found most of their study sample were having good monthly income and were having moderate socio-economic status. The distribution of the students according to their mean overall knowledge scores, revealed that (78.8%) had good knowledge and (21.2%) had fair knowledge while none of the students showed poor knowledge, in which all domains of personal hygiene have good knowledge except the two domains (nose hygiene, skin hygiene and bathing) have fair assessment for knowledge. This result is supported by a similar study of (Radhi et al., 2017) in which they found that the majority of the students indicate that the (73%) of students were having good knowledge and (23%) were poor knowledge regarding personal hygiene. Related to Statistical Results of Regression Analysis to determine the contributory factors affecting the knowledge of intermediate school’s students, results of current study appeared the main contributory factors affecting the knowledge of the intermediate school’s students about personal hygiene were female gender, accommodation (separated), advanced father’s education, monthly income of the family > 800,000 IQD and good academic achievement, by comparing the odds ratios of these contributory factors, the larger effect was attributed to good academic achievement of the student (OR = 2.03), followed by separated accommodation (OR = 1.92), female gender (OR = 1.73), monthly income of the family (> 800) (OR = 1.46) and advanced father’s education (OR = 1.33). That indicated the students with good academic achievement had good knowledge about personal hygiene. This result of current study is supported by similar study conducted in the Sharjah, United Arab Emirates by (Ghanim et al., 2016) among primary school students to assess knowledge of personal, they demonstrated that the knowledge of personal hygiene was correlated to academic achievements of school student. Regarding the separated accommodation, it had significant associated with knowledge of students about personal hygiene, that mean a good personal hygiene knowledge was more common among the students from family type that living in separated accommodation compared to the student who lives with sharing family. Previous studies from different countries have reported that infection with some micro-organisms was more frequency in children having a large family type with sharing. Concerning female gender students had higher personal hygiene knowledge than boy students. In a study assessed the hygiene status in primary school students in an urban area, hygiene scores have been found to be higher in female students compared to the male. Regarding the monthly income of the family (> 800), That mean increased knowledge of the students regarding personal hygiene increased with increasing monthly income of family. This result agrees with the study which was conducted in Turkey by (Arikan et al., 2014) in that they studied the personal hygiene status among primary school students, where showed that the number of students having an adequate personal hygiene decreased with decreasing family income level. As well as advanced father’s education where the proportions of students with good knowledge increased with advancing in father’s level of education. This result contradicted with (Arikan et al., 2014) study who studied the personal hygiene status in an urban area in the west of Turkey among primary school students, where they found that the personal hygiene status was not correlated with
parent education level. This difference in results may be due to the father in the Iraqi communities is considered the leader and the first teacher of his family.

Table 1. Distribution of the Intermediate Schools’ Students by their Sociodemographic Characteristics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>115</td>
<td>24.6</td>
</tr>
<tr>
<td>14</td>
<td>112</td>
<td>23.9</td>
</tr>
<tr>
<td>15</td>
<td>123</td>
<td>26.3</td>
</tr>
<tr>
<td>16</td>
<td>118</td>
<td>25.2</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>234</td>
<td>50.0</td>
</tr>
<tr>
<td>Female</td>
<td>234</td>
<td>50.0</td>
</tr>
<tr>
<td>Accommodation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>315</td>
<td>67.3</td>
</tr>
<tr>
<td>Sharing</td>
<td>153</td>
<td>32.7</td>
</tr>
<tr>
<td>School grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>149</td>
<td>31.8</td>
</tr>
<tr>
<td>Second</td>
<td>151</td>
<td>32.3</td>
</tr>
<tr>
<td>Third</td>
<td>168</td>
<td>35.9</td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>69</td>
<td>14.7</td>
</tr>
<tr>
<td>Read and write</td>
<td>68</td>
<td>14.5</td>
</tr>
<tr>
<td>Primary</td>
<td>102</td>
<td>21.8</td>
</tr>
<tr>
<td>Intermediate</td>
<td>130</td>
<td>27.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>40</td>
<td>8.5</td>
</tr>
<tr>
<td>College and above</td>
<td>59</td>
<td>12.6</td>
</tr>
<tr>
<td>Father’s education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>41</td>
<td>8.8</td>
</tr>
<tr>
<td>Read and write</td>
<td>65</td>
<td>13.9</td>
</tr>
<tr>
<td>Primary</td>
<td>64</td>
<td>13.7</td>
</tr>
<tr>
<td>Intermediate</td>
<td>115</td>
<td>24.6</td>
</tr>
<tr>
<td>Secondary</td>
<td>84</td>
<td>17.9</td>
</tr>
<tr>
<td>College and above</td>
<td>99</td>
<td>21.2</td>
</tr>
<tr>
<td>Father’s occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governmental employee</td>
<td>242</td>
<td>51.7</td>
</tr>
<tr>
<td>Self-employed</td>
<td>226</td>
<td>48.3</td>
</tr>
<tr>
<td>Mother’s occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governmental employee</td>
<td>385</td>
<td>82.3</td>
</tr>
<tr>
<td>Housewife</td>
<td>83</td>
<td>17.7</td>
</tr>
<tr>
<td>Monthly income of the family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Thousand IQD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 – 600</td>
<td>218</td>
<td>46.6</td>
</tr>
<tr>
<td>601 – 800</td>
<td>106</td>
<td>22.6</td>
</tr>
<tr>
<td>&gt; 800</td>
<td>144</td>
<td>30.8</td>
</tr>
<tr>
<td>Academic achievement of the student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>266</td>
<td>56.8</td>
</tr>
<tr>
<td>Middle</td>
<td>165</td>
<td>35.3</td>
</tr>
<tr>
<td>Low</td>
<td>37</td>
<td>7.9</td>
</tr>
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</table>
Table 2. Distribution of the Intermediate schools student’s knowledge about personal hygiene by their domains.

<table>
<thead>
<tr>
<th>Domains</th>
<th>Mean score</th>
<th>assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>General statement of Personal hygiene</td>
<td>2.51</td>
<td>Good</td>
</tr>
<tr>
<td>Clothes hygiene</td>
<td>2.62</td>
<td>Good</td>
</tr>
<tr>
<td>Skin hygiene and bathing</td>
<td>2.34</td>
<td>Fair</td>
</tr>
<tr>
<td>Hair hygiene</td>
<td>2.48</td>
<td>Good</td>
</tr>
<tr>
<td>Oral hygiene</td>
<td>2.44</td>
<td>Good</td>
</tr>
<tr>
<td>Eyes hygiene</td>
<td>2.70</td>
<td>Good</td>
</tr>
<tr>
<td>Ears hygiene</td>
<td>2.45</td>
<td>Good</td>
</tr>
<tr>
<td>Nose hygiene</td>
<td>2.29</td>
<td>Fair</td>
</tr>
<tr>
<td>Hands and nails hygiene</td>
<td>2.59</td>
<td>Good</td>
</tr>
<tr>
<td>Foot hygiene</td>
<td>2.57</td>
<td>Good</td>
</tr>
<tr>
<td>Overall knowledge</td>
<td>2.51</td>
<td>Good</td>
</tr>
</tbody>
</table>

Table 3. Results of binary logistic regression analysis the contributory factors of knowledge of the intermediate school students.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds ratio (OR)</th>
<th>95% C.I. for OR</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.00</td>
<td>0.75 – 1.32</td>
<td>0.97</td>
</tr>
<tr>
<td>Gender</td>
<td>1.73</td>
<td>1.06 – 2.83</td>
<td>0.03</td>
</tr>
<tr>
<td>Accommodation</td>
<td>1.92</td>
<td>1.18 – 3.13</td>
<td>0.01</td>
</tr>
<tr>
<td>School grade</td>
<td>1.45</td>
<td>0.97 – 2.17</td>
<td>0.07</td>
</tr>
<tr>
<td>Father’s education</td>
<td>1.33</td>
<td>1.13 – 1.57</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>0.95</td>
<td>0.80 – 1.12</td>
<td>0.53</td>
</tr>
<tr>
<td>Monthly income of the family (&gt; 800)</td>
<td>1.46</td>
<td>1.07 – 2.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Academic achievement of the student</td>
<td>2.03</td>
<td>1.41 – 2.92</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

95% C.I. for OR: 95% confidence interval of the odds ratio

CONCLUSIONS

The study concluded that the overall knowledge of the intermediate school students about personal hygiene were good. In which all domains of personal hygiene have good knowledge except the two domains (nose hygiene, skin hygiene and bathing) have fair knowledge. Moreover, it was found that female gender, separated accommodation, advanced father’s education, monthly income of the family > 800,000 IQD and good academic achievement are the main contributory factors that influencing on knowledge of students about personal hygiene.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Community Health Nursing Department, College of Nursing, University of Babylon, Hilli City, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Education Program to Improve Mother’s Knowledge about Management of Children with Pinworms

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ABSTRACT

Pinworm it’s also known Entrobius vermicularis is one of the most common Human being parasitic infections worldwide especially in temperate weather. A quasi-experimental design study has been carried out in Al-Diwaniya city from some kindergartens conducted throughout the period of October 18th, 2017 to august 5th, 2018. Cluster sample is comprised of 40 mothers divided into two groups: study group involves of 20 mothers which exposed to the educational program and control group involves of 20 mothers not exposed to the program. Results of our study show that the effectiveness of educational program regarding mother’s knowledge about management of children with pinworm infection is positive and clear. It also shows that there is a good development with highly significant differences in study group between pre and post-test in all items associated to management of children with pinworms. The study concluded that the educational program is an appropriate and active to improve the mother’s knowledge about management of children with pinworms. Also the study concludes that the most of mothers as general is knowledge deficit regarding management of children with pinworm infection.

Keywords: Pinworms, Education program , Children

INTRODUCTION

Pinworm it’s a cosmopolitan parasite with particularly high prevalence in countries with a temperate climate. It has the widest distribution of any parasitic helminthes, and is the estimated that approximately 200 million infected in the people internationally. it has become the most common intestinal parasite seen in a primary care setting, regardless of factors such as race, socioeconomic status, and culture. As such, pinworm serves as an exception to the general rule that intestinal parasites are uncommon in rich societies ¹ ². Pinworm occur in all countries of the world and not except for the ages and social and economic levels, it occurs in all ages and in all levels of life, and specially in children between the ages of 3-12 years and even after treatment causes infection social problems in the family who need to take protections from spread of infection ³. Kindergartens and primary schools are the most common places through direct contact between children. Any child can become infected. However, preschool and school-aged children, household contacts of infected children and people in a hospital, nursing home, or other group settings are more likely to become infected than other people ⁴ ⁵. To avoid reinfection, washing all clothes and bed linens by hot water and vacuuming the house may be suggested. However, there is little documentation on the effectiveness of these measures because pinworms survive on many surfaces. Caring recommendations include hand washing before eating and after toileting and keeping the child’s fingernails short to lessen the chance of eggs collecting under the nails, dressing children in one piece sleeping clothes ⁶ ⁷. The previous study confirm the family also needs a health education program to reduce the Entrobius vermicularis infection and to improve the care of mothers of infected children. This study is believed to help parent and mothers also improve their information and practices towards the infection of pinworms ⁸.

DOI Number: 10.5958/0976-5506.2018.01218.4
MATERIALS AND METHODS

Research design

To achieve the purpose of the study a pre-post-test quasi experimental design was conducted.

Setting

This study was conducted in Al-Diwaniya province for the mothers of children infected with pinworms in some of the kindergarten and data collection during the October 18th, 2017 to August 5th, 2018.

Study sampling

Purposive sample involve of 40 mothers. The sample is distributed in two groups; 20 mothers as study group are exposed to the education program, and the other 20 mothers are not exposed to the program considered as the control group.

Implementation of the Program

The application of program is presented to study group include the following:

- Demographic characteristics form is written by each mother of children with pinworm in the kindergarten in study and control groups including (age, gender, residency, socio-economic status, education level, occupation and house size).

- Mother’s knowledge test consists of (30) multiple choice questions have been introduced to both study and control groups including (definition of pinworm , life cycle of pinworm causes of pinworm infection , signs and symptoms, complication, diagnosis, treatment and finally management of children with pinworm infection). The knowledge test duration lasted from (25-30) minutes. The post-test took less time than the pre-test about (5) minutes depending on the response of mothers for knowledge test.

- The educational program is introduced to the (20) mothers in the study group. The program has taken a period of (two hours and 30 min) in the AL.Daghara Kindergarten.

- All of study group is examined by fallow up after 21 days of implementing the program.

- Control group the similar to above steps is followed except the mother’s educational program.

After the end of lecture that the researcher took the number of telephone, mobile/ house for some mother was taken in order to call her for follow up. Each mother was reassured that the information obtained was confidential and used only for the purpose of the study.

Statistical Analysis

The data of the present study were analyzed through the use of statistical package of social sciences (SPSS) version 19. Comparison between groups was done using chi square and. p-value of 0.05.

RESULTS AND DISCUSSION

The studied samples included 40 mothers of children diagnosed with pinworm. participant at age groups was (25-29) years, (35%) in the study group and (30%) in the control group. Regarding the family residence, it is clear that more than half of them (75%) came from urban area in study group , and (80%) control group. About (60%) of mothers had a family size 5 and less than in study group and (70%) in control group. Regarding mothers’ occupation, it was observed that more than half of them (55%) were jobless in study group compared to (35%) who were free job and (35%) Governmental Employee in control group. Regarding the level of education, the highest percentage is (35%) of the sample in study group are Intermediate School, and (35%) of the control group are Intermediate School. The monthly income status of the study sample are (40%) Sufficient To Some Extent in study group and (45%) in control group are Sufficient .and house size (150-200 M2 ) regarding (45%)in study group and in (100-150 M2 ) is (45%) in control group. This (table 1). And demographic data of children show (95%) of studied children aged between more than 3 years in study group and (90%) in control group . Females constitute (60%) in study group .while (55%) in control group (table 2). That most the study group have been poor knowledge in (85%) of the items in pre-test, while of them (90%) in control group in same items in pre-test before exposed to education program (table 3). Demonstration of the overall assessment of the study participants (study and control groups) after performing the education program (post-test). This table reveals that the study group participants passed the assessment, (1.73) mean of score. The control group had failed in the assessment (1.33) mean of score (table 4). In this study shows that most the study group have been weak.
knowledge at mean (1.29) of the items in pre-test, while all of them (1.73) are good in same items in post-test after exposed to educational sessions. Moreover, we see a slight decline in information at mean (1.56) in the second post-test (table 5). According to (Table 4.1) in the results, the study shows no significant difference between the study and control groups regarding Socio-Demographic data. The high ratio of infection may be associated with the low socio-cultural status of the family whose children were infection, low personal hygiene and large numbers of children were playing every day together and this has easy the spreading of the infections. This agree with Kadir and Amin. Regarding the family residence, it is clear that more than 70% of mothers were living in urban areas; while 25% in rural area. This result is support by Amein et al. Anuar et al. We think that this is due to the large number of kindergartens in urban areas and their low prevalence in rural areas. In this study show there was also an association between crowded families (<5) and Enterobiasis in our study. The increased transmission may be due to elder brothers or sisters who are attending school. This agree with Artan et al. Overcrowded conditions of home members may be lead to intra family transmission from close contacts of crowded houses. Also this finding supported with Forson et al. The findings of the present study showed that more than half of mothers were jobless in the study group and this result agree with Amein et al. The results of the study showed regarding mothers’ also the low level of mother’s education had Intermediate School, and low level of occupation (jobless) were significant risk factors for infection with Entrobius. These were in accordance with El-Masry et al. The results of the study showed that very few children in both groups were less than three years old, while the largest proportion of children between the ages of 3 and 6 years. Enterobiasis are common in this age as well. This may be associated with young children with poor health practices, so the risk of transmission is high at this age. This result was supported Scariati, Roberge and Dye. The results of present study show disagreed with other studies which indicated that the high infection in female than male. This result agrees with Rahi and Morad. The high rate of infection between the female is likely to be connected with their daily housework, contact with bed sheet and cloth for infected person. This agree with Ali et al.

Table 1. Study Sample Demographic Data.

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Rating And Scoring</th>
<th>Study Group</th>
<th>Control Group</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Age / Years</td>
<td>&lt;= 24</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>25 - 29</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>30 - 34</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>35 - 39</td>
<td>3</td>
<td>15%</td>
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<tr>
<td></td>
<td>40+</td>
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<td>10%</td>
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<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>Residency</td>
<td>Urban</td>
<td>15</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
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<td>25%</td>
</tr>
<tr>
<td>Total</td>
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<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>Family Member</td>
<td>5 And Less</td>
<td>12</td>
<td>60%</td>
</tr>
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<td>6 And More</td>
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<td>40%</td>
</tr>
<tr>
<td>Total</td>
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<td>100%</td>
</tr>
<tr>
<td>Occupation</td>
<td>Governmental Employee</td>
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<td>Free Job</td>
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<td>Jobless</td>
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<td>55%</td>
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<td>Total</td>
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<td>100%</td>
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<td>Primary School</td>
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<td>Intermediate School</td>
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<tr>
<td></td>
<td>Secondary School</td>
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<tr>
<td></td>
<td>Institute / College</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100%</td>
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Table 2. Children Demographic Data.

<table>
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<tr>
<th>Child Demographic Data</th>
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<td>Control group</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Age / Years</td>
<td>&lt;= 3.00</td>
<td>1</td>
<td>5%</td>
<td>2</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.01+</td>
<td>19</td>
<td>95%</td>
<td>18</td>
<td>90%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100%</td>
<td>20</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Gender</td>
<td>Male</td>
<td>8</td>
<td>40%</td>
<td>9</td>
<td>45%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>12</td>
<td>60%</td>
<td>11</td>
<td>55%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100%</td>
<td>20</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Assessment of Mothers’ Knowledge (Study and Control Groups) before the Application of the Program (pre-test)

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Groups</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study Group</td>
<td>Control Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Mean</td>
<td>Freq.</td>
<td>%</td>
<td>Mean</td>
</tr>
<tr>
<td>Fail</td>
<td>17</td>
<td>85%</td>
<td>1.29</td>
<td>18</td>
<td>90%</td>
<td>1.35</td>
</tr>
<tr>
<td>Pass</td>
<td>3</td>
<td>15%</td>
<td></td>
<td>2</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0%</td>
<td></td>
<td>20</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Independent sample t-test value (1.60), d.f. (38), p-value (0.116) NS

Table 4. Assessment of Mothers’ Knowledge (Study and Control Groups) after the Application of the Program (post-test)

<table>
<thead>
<tr>
<th>Post-test</th>
<th>Groups</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study Group</td>
<td>Control Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Mean</td>
<td>Freq.</td>
<td>%</td>
<td>Mean</td>
</tr>
<tr>
<td>Pass</td>
<td>19</td>
<td>95%</td>
<td>1.73</td>
<td>2</td>
<td>10%</td>
<td>1.33</td>
</tr>
<tr>
<td>Fail</td>
<td>1</td>
<td>5%</td>
<td></td>
<td>18</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
<td></td>
<td>20</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Independent sample t-test value (13.5), d.f. (38), p-value (0.001) HS

**CONCLUSION**

The results showed that most mothers had a marked lack of knowledge regarding management of children with pinworms, where clear improvements in mothers’ knowledge after the post test of the study group of the educational program on the management of children with pinworms and the control group did not provide an adjustment in their knowledge of the pinworms in the pre and post-test.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Pediatric Nursing Faculty of Nursing, kufa University, Najaf, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Effect of Exposure to Glyphosate Pesticide, Cadmium and Chromium on Biomass of Algae (Chlorococcum Humicola and Chlorella Vulgaris) in Polluted Aqueous Culture

Bushra K Shaker¹, Ibrahim M A Alsalman¹, Mahdi S Al-Attabi²

¹Biology Department, College of Education for Pure Science (Ibin-Alhaitham), University of Baghdad, Baghdad City, Iraq. ²Agricultural Researches Center-Ministry of Agriculture, Baghdad City, Iraq

ABSTRACT

The present study investigated the effect of exposure to different concentrations of Glyphosate pesticide, cadmium and chromium elements in the polluted water medium on tolerance and the effectiveness of two algae Chlorococcum humicola and Chlorella vulgaris biomass by applying different concentrations (25,50,75,100) mg / L⁻¹ of pesticide, Cd and Cr (2.5, 7.5, 10, 12, 15, 20 and 25) (1, 2, 3, 4, 5) mg /L⁻¹ respectively, with exposure time (3, 6, 9 and 12) days under laboratory conditions of the temperature of 25± 2°C, the intensity of light 3000 lux with 16 hours of light and 8 darkness and pH 7± 2 in static medium. The results showed that of the algae species used in the study was characterized by the ability to tolerate the Glyphosate pesticide concentrations of (25 - 100) mg / L⁻¹ as well as the ability of the C.humicola to tolerate high concentrations of cadmium (2.5, 7.5, 10,12.5) mg/L⁻¹ and the ability of the two algae to tolerate concentrations of chromium (1, 2, 3, 4, 5) mg/L⁻¹.

Keyword: Algae, Biomass, Cadmium, Chromium, Chlorococcum humicola, Chlorella vulgaris

INTRODUCTION

Recently, the problem of the exposure of the aquatic environment, especially the surface and fresh, to pollute many pollutants, including pollution of water with industrial wastes, including heavy metals and various pesticides is the most environmental problems. Pollution of heavy metals and pesticides today is one of the most important types environmental pollution as a result of emissions from heating, automobile exhausts, factories and many other human activities as well as agricultural residues such as the addition of fertilizers, the widespread use of pesticides in agricultural processes and pest control, which affecting the environmental balance of the water system ¹. Due to the difficulty of dealing with heavy elements and some types of pesticides in destroyed environmental displacement because of its ability to correlate with its atoms, its tendency to the union of other chemical compounds, their ability to penetrate the vital components of food chains, the various environmental communities and bioaccumulation and chemical and stay in the environment for long periods, make researchers think seriously to find different techniques to solve this problem, but most of these physical, chemical and engineering techniques require specialized management and cost large amounts ²-⁷. The bioremediation method is one of the most modern and best methods, and is known as the use of microscopic microorganisms to remove or destroy contaminants. Micronutrients may be fungus, algae, or bacteria³. Therefore, a scientific trend has been created to use these different organisms and to search for the most efficient ones, either soft or dry parts, to test their biological treatment capacity and the withdrawal of environmental toxins. In practice, significant differences are observed between the effectiveness of these organisms toward the removal and elimination of contaminants on the one hand or the impossibility of carrying out this role with some toxins, contaminants and heavy metals,
which requires preliminary tests to detect the tolerance of the concentrations used and corresponding biomass capable of processing the best image 8-12. Therefore, this study aimed at the current study by exposing the cells of the biomass in the static and moving of two types of algae Chlorococcum humicola and Chlorella vulgaris for different concentrations Glyphosate and elemental cadmium, chromium, and to find out their ability to withstand the pesticide and heavy metals from contaminated water circles.

MATERIALS AND METHOD

Sampling and site location

Three plants were selected to collect samples of the target algae from the natural environment (water of the Tigris River) from the Al-Dora area to the area of the bridge Al-Muthanna and then enter the river to the city of Al-Kadhimiya within the province of Baghdad. These three sites were selected on the basis of diversity of human activities as well as some small facilities and laboratories. The algae species were collected from three different sites (near the Al-Doura refinery, opposite the city of Al-Kadhimiya, the city of medicine).

Isolation and diagnosis of algae

The algae were isolated using the dilution method and planning method using semi-solids by adding 1.5% to 2%. The plates and tubes were examined after their development inside the incubator at a temperature of 2-25°C and a lighting system 6. 50 ml of isolated colony was taken and placed in the dark for 24 hours, pull 10 ml of colony after incubation in the dark by a sterile pipette and add to the same liquid medium in which isolation was developed with the addition of drops of broth nutrient was incubated again then use the centrifugal device at 3000 cycles/minute for two minutes. After that, the deposit was retained, the suspension was removed and the deposit was washed by the sterile medium. The washing process was repeated from 12 to 15 times after which a portion of each sample was deposited on the nutrients medium of solid bacterial growth test prepared by dissolving 15 gm of nutritious per liter of distilled water.

Preparation of heavy metal and pesticide solutions

Cd and Cr metal solutions were prepared by dissolving 3.7 gm of Cr and K₂CrO₄ was considered a source of it whereas Cd was prepared by dissolving 1.8 g/L and using CdCl₂+H₂O as its source. While a glyphosate (Ground-up SL) was taken as liquid concentrated with an active substance of 480 mg or equal (36% w/v), from the production of VAPCO. The concentrations was prepared according to the following formula: C₁V₁ = C₂V₂.

Statistical analysis

The results of the measurements and the studied traits were analyzed according to the complete randomized design (CRD) using the statistical program SAS, then the means were compared using the Least Significance Difference (LSD). The significance of the ANOVA was measured at the level probability (P0.05) with three replicates.

RESULTS AND DISCUSSION

The results of the development of the algae tested in the liquid medium containing the ascending concentrations of the pesticide (25, 50, 75, 100) mg/L-¹ showed clear variations in the level of growth and cell density. The results of Table (1) showed the highest biomass recorded biomass obtained in terms of absorbance at wavelength (650) nm by the C. humicola in terms of applied tolerance 0.529 - 0.774 at 25 mg/L-¹ concentration in the static and mobile medium respectively for the 12th day with a gradual decrease in biomass 0.325 - 0.412 at 100 mg/L-¹ for the static and mobile medium respectively, and when calculating the percentage of the effect level caused by the presence of concentrations of the pesticide on the mean of the biomass. The highest effect of C. humicola was 71.7% on 9th day of the static medium, while the highest effect was 50.50% in mobile medium at the 12th day of treatment.

The mean mass of C. vulgaris in table (2) was the highest of 493-0.417. At the concentration of 25 mg/L-¹ concentration in the static and mobile medium respectively for the 12th day with a gradual decrease in biomass 0.325 - 0.412 at 100 mg/L-¹ for the static and mobile medium respectively, and when calculating the percentage of the effect level caused by the presence of concentrations of the pesticide on the mean of the biomass. The highest effect on the biomass with the presence of the pesticide was 81.20% for 12th day of the treatment in the mobile medium and 79.51% in the mobile medium for 9th day of the treatment. The extent and persistence of these phases give an indication of the efficiency of the algae and the suitability of cultural medium, quality
and composition (the physical chemical conditions) surrounding the culture, and hence the expected production of the algae biomass. The results showed that *C. humicola* showed the highest tolerate in the static and mobile medium than *C. vulgaris*. The biomass of all concentrates in the mobile medium was higher than that of the static medium, starting from the control sample to the lowest concentration of the pesticide. The results showed that *C. vulgaris* did not tolerate the high concentrations of 75 and 100 mg/L⁻¹ of the pesticide, which was accompanied by a gradual decrease in continuous readings of pH values during the experiment with a limit of 6.2-6.5, causing a significant decrease in tolerate values and number of cells. The results were consistent with the results of on the effect of pH values on the algae biomass that was reported to be levels of prosperity and multiplication of algae at the highest values pH (7 - 9.4) and the best value of pH for most algae was up (8.2-8.7). The results of the Cd component shown in Table (3) for *C. humicola*, which showed high tolerability starting from 2.5 to 25 mg/L⁻¹, recorded the highest mean biomass obtained in terms of absorbance at wavelength (650) nm 1.107 at the concentration of 5 mg/L⁻¹ in the static medium and recorded the lowest mass of 0.531 at 25 mg/L⁻¹ concentration while in the mobile medium the highest biomass was 1.205 at 5 mg/L⁻¹ on 12th day and the lowest mass of 0.403 at 25 mg/L⁻¹. Whereas calculating the cadmium effect ratio on the biomass, the highest percentage of mass recorded in *Chumicola* was 52.26% got a significant decrease in the mobile medium as recorded 29.14% for the third day. While *C. vulgaris* showed tolerance to concentrations of (2.5) - (12.5) mg/L⁻¹ for the cadmium component shown in Table (4) and the highest living mass was 0.503 - 0.611 at 2.5 mg/L⁻¹ and was the lowest mass 0.094-0.214 at the concentration of 12.5 mg/L⁻¹ at 12th day in the static and mobile medium respectively. The results showed that there is a difference in the effect of the two algae on the cadmium. *C. humicola* was more effective and tolerated for high concentrations of Cd during the static and mobile medium than *C. vulgaris*. Therefore, adsorption large amount of various ions element such as Cd. The results of the development of the tested algal species showed growth in the liquid medium containing elevated concentrations of chromium (1, 2, 3, 4, 5) mg / L⁻¹ on the biomass averages.

**Table 1. Effect of different concentrations of glyphosate in biomass of *C. humicola* algae isolates in terms of absorption (650 nm) in the static and mobile medium.**

<table>
<thead>
<tr>
<th>Concentration (mg/L)</th>
<th>3 day</th>
<th>6 day</th>
<th>9 day</th>
<th>12 day</th>
<th>3 day</th>
<th>6 day</th>
<th>9 day</th>
<th>12 day</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.291±0.003</td>
<td>0.610±0.002</td>
<td>a</td>
<td>0.909±0.003</td>
<td>a</td>
<td>1.111±0.003</td>
<td>a</td>
<td>1.346±0.002</td>
<td>a</td>
</tr>
<tr>
<td>25</td>
<td>0.161±0.002</td>
<td>0.207±0.003</td>
<td>b</td>
<td>0.327±0.001</td>
<td>b</td>
<td>0.529±0.002</td>
<td>b</td>
<td>0.288±0.001</td>
<td>b</td>
</tr>
<tr>
<td>50</td>
<td>0.126±0.002</td>
<td>0.188±0.002</td>
<td>b</td>
<td>0.283±0.004</td>
<td>b</td>
<td>0.416±0.003</td>
<td>b</td>
<td>0.241±0.017</td>
<td>b</td>
</tr>
<tr>
<td>75</td>
<td>0.114±0.003</td>
<td>0.174±0.002</td>
<td>b</td>
<td>0.240±0.003</td>
<td>b</td>
<td>0.367±0.005</td>
<td>b</td>
<td>0.159±0.002</td>
<td>b</td>
</tr>
<tr>
<td>100</td>
<td>0.103±0.001</td>
<td>0.158±0.002</td>
<td>b</td>
<td>0.201±0.001</td>
<td>b</td>
<td>0.325±0.002</td>
<td>b</td>
<td>0.121±0.025</td>
<td>b</td>
</tr>
<tr>
<td>LSD</td>
<td>0.193 NS</td>
<td>0.226 *</td>
<td>0.283 *</td>
<td>0.335 *</td>
<td>0.225 NS</td>
<td>0.238 *</td>
<td>0.361 *</td>
<td>0.448 *</td>
<td>---</td>
</tr>
</tbody>
</table>

Rate of Effectiveness  56.70 b | 70.20 a | 71.09 a | 63.16 b | 41.54 c | 41.05 c | 49.76 b | 50.50 b | 8.48 *
Table 2. Effect of different concentrations of glyphosate in the biomass of *C. vulgaris* isolate in terms of absorption (650 nm) in the static and mobile medium.

<table>
<thead>
<tr>
<th>Concentration mg/L.</th>
<th>Static medium</th>
<th>Mobile medium</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 day</td>
<td>6 day</td>
<td>9 day</td>
</tr>
<tr>
<td>0</td>
<td>0.186±0.002 a</td>
<td>0.552±0.004 a</td>
<td>0.867±0.004 a</td>
</tr>
<tr>
<td>25</td>
<td>0.127±0.002 b</td>
<td>0.157±0.001 b</td>
<td>0.276±0.002 b</td>
</tr>
<tr>
<td>50</td>
<td>0.119±0.001 b</td>
<td>0.138±0.002 b</td>
<td>0.159±0.002 b</td>
</tr>
<tr>
<td>75</td>
<td>0.092±0.002 b</td>
<td>0.125±0.003 b</td>
<td>0.143±0.090 b</td>
</tr>
<tr>
<td>100</td>
<td>0.08±0.003 b</td>
<td>0.108±0.005 b</td>
<td>0.136±0.004 b</td>
</tr>
<tr>
<td>LSD</td>
<td></td>
<td>0.114 NS</td>
<td>0.322 *</td>
</tr>
<tr>
<td>Rate of Effectiveness</td>
<td>43.81 b</td>
<td>76.08 a</td>
<td>79.41 a</td>
</tr>
</tbody>
</table>

Table 3. Effect of different concentrations of cadmium on the biomass of algae isolates *C. humicola* in terms of absorption (650 nm) in the static and mobile medium.

<table>
<thead>
<tr>
<th>Concentration mg/L.</th>
<th>Static medium</th>
<th>Mobile medium</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 day</td>
<td>6 day</td>
<td>9 day</td>
</tr>
<tr>
<td>0</td>
<td>0.387±0.196 a</td>
<td>0.609±0.001 a</td>
<td>0.906±0.002 a</td>
</tr>
<tr>
<td>2.5</td>
<td>0.304±0.001 b</td>
<td>0.567±0.012 ab</td>
<td>0.963±0.001 a</td>
</tr>
<tr>
<td>5</td>
<td>0.264±0.003 b</td>
<td>0.56±0.001 ab</td>
<td>0.94±0.001 a</td>
</tr>
<tr>
<td>7.5</td>
<td>0.257±0.001 b</td>
<td>0.54±0.001 ab</td>
<td>0.89±0.002 a</td>
</tr>
<tr>
<td>10</td>
<td>0.248±0.001 b</td>
<td>0.53±0.005 ab</td>
<td>0.88±0.004 a</td>
</tr>
<tr>
<td>12.5</td>
<td>0.234±0.002 b</td>
<td>0.47±0.003 ab</td>
<td>0.87±0.001 a</td>
</tr>
<tr>
<td>15</td>
<td>0.226±0.001 b</td>
<td>0.45±0.002 ab</td>
<td>0.80±0.002 a</td>
</tr>
<tr>
<td>20</td>
<td>0.214±0.002 b</td>
<td>0.44±0.002 ab</td>
<td>0.75±0.004 a</td>
</tr>
<tr>
<td>25</td>
<td>0.195±0.003 b</td>
<td>0.23±0.180 b</td>
<td>0.346±0.002 b</td>
</tr>
<tr>
<td>LSD</td>
<td>0.215 NS</td>
<td>0.352 *</td>
<td>0.377 *</td>
</tr>
<tr>
<td>Rate of Effectiveness</td>
<td>52.26 a</td>
<td>21.81 c</td>
<td>10.84 d</td>
</tr>
</tbody>
</table>
Table 4. Effect of different concentrations of cadmium on the biomass of *C. vulgaris* in terms of absorbance (650nm) in the static and mobile medium.

<table>
<thead>
<tr>
<th>Concentration (mg/L)</th>
<th>3 day</th>
<th>6 day</th>
<th>9 day</th>
<th>12 day</th>
<th>3 day</th>
<th>6 day</th>
<th>9 day</th>
<th>12 day</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.227±0.01</td>
<td>0.551±0.001</td>
<td>0.893±0.002</td>
<td>1.025±0.001</td>
<td>0.576±0.002</td>
<td>0.722±0.002</td>
<td>0.902±0.002</td>
<td>1.076±0.002</td>
<td>0.361 *</td>
</tr>
<tr>
<td>2.5</td>
<td>0.224±0.02</td>
<td>0.503±0.001</td>
<td>0.489±0.002</td>
<td>0.477±0.002</td>
<td>0.486±0.002</td>
<td>0.611±0.002</td>
<td>0.507±0.001</td>
<td>0.486±0.005</td>
<td>0.375 NS</td>
</tr>
<tr>
<td>5</td>
<td>0.213±0</td>
<td>0.437±0.002</td>
<td>0.371±0.001</td>
<td>0.305±0.001</td>
<td>0.428±0.001</td>
<td>0.585±0.004</td>
<td>0.349±0.001</td>
<td>0.336±0.002</td>
<td>0.344 NS</td>
</tr>
<tr>
<td>7.5</td>
<td>0.169±0.001</td>
<td>0.395±0.002</td>
<td>0.255±0.003</td>
<td>0.182±0.002</td>
<td>0.413±0.001</td>
<td>0.543±0.002</td>
<td>0.332±0.003</td>
<td>0.326±0.002</td>
<td>0.398 NS</td>
</tr>
<tr>
<td>10</td>
<td>0.121±0.005</td>
<td>0.317±0.001</td>
<td>0.213±0.002</td>
<td>0.104±0.001</td>
<td>0.319±0.001</td>
<td>0.474±0.001</td>
<td>0.281±0.004</td>
<td>0.233±0.002</td>
<td>0.288 *</td>
</tr>
<tr>
<td>12.5</td>
<td>0.118±0.001</td>
<td>0.140±0.002</td>
<td>0.103±0.001</td>
<td>0.094±0.002</td>
<td>0.235±0.003</td>
<td>0.259±0.004</td>
<td>0.256±0.002</td>
<td>0.214±0.003</td>
<td>0.206 *</td>
</tr>
<tr>
<td>LSD</td>
<td>0.167 NS</td>
<td>0.305 *</td>
<td>0.367 *</td>
<td>0.398 *</td>
<td>0.367 NS</td>
<td>0.351 *</td>
<td>0.387 *</td>
<td>0.371 *</td>
<td>---</td>
</tr>
</tbody>
</table>

Rate of Effectiveness

| Rate of Effectiveness | 25.55 | 35.02 d | 67.30 bc | 77.36 a | 38.19 cd | 44.73 c | 59.97 b | 74.07 ab | 8.06 * |

CONCLUSIONS

A number of conclusions can be drawn from the study, including that the tested algae have been extensively adapted to the resistance of concentrations used by the glyphosate pesticide and cadmium and chromium elements which encourages their use in the biological treatment. The mass of *C. humicola* recorded a higher tolerance than *C. vulgaris* in the static and moving medium when exposed to the pesticide and Cd and Cr elements also recorded a higher tolerance in mobile than static medium.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Biology Department, College of Education for pure Science (Ibn Al-Haitham), University of Baghdad, Baghdad city, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Effect of the Strategy of Hearing-Triangle in the Reading Understanding for the Elementary Education’s Pupils

Athmar Hamza Turki, Ibtisam Sahib Al-Zuwainy

College of Basic Education, University of Babylon, Babylon Government, Hillah City, Iraq

ABSTRACT

The research aimed to identifying the effect of the strategy of hearing-triangle in the reading understanding for the elementary education’s pupils, the researcher intended the experimental method as a methodically for the procedures of research that included an independent variable (strategy of hearing-triangle, ordinary method), a dependent variable (reading understanding), she relied on the experimental design of partial discipline to control the research’s variables, before starting the executing the experiment, the researcher equalized between the two groups of research in order to have accurate and subjective results by the following variables (age by months, education of parents, first semester degrees in Arabic material), after executing the equivalent between the two groups of the research, the researcher started preparing the application requirements such as plans, goals and test for the two groups then after finishing the application of the experiment, the researcher commenced to apply research tools for the two groups of research, after checking the answers of pupils, she got the data of the controlling and experimental groups, these results were dealt with statistically by (t-test) for two independent samples have results, the experimental group which was learnt by the strategy of hearing-triangle went better than controlling groups which studied according to the ordinary method.

Keywords: strategy of hearing-triangle, reading understanding, primary grade’s students.

INTRODUCTION

Education represented humanitarian effort to modify the behavior of human being, societies and individuals into wanted destinations along the age, in different social and spatial circumstances, existed since the first appearance of human being on this planet, he learnt it unintentionally since he was in the caves and valleys, it appeared to him when he was chasing the nature for the life and continuity, it tries to develop and rise level of human to the lofty, it is art and science each accomplishes the other, science means knowledge and art means skill and talent to apply this knowledge, consequently, the art is nothing more than application of the art. God had specified it for human being only and not for any other kinds of creatures, education is a directing, consulting, training and caring by the society for the human individual to reach a good grade of mental, psychological, behavioral and social perfection, to able to live appropriately, since first day of birth till the final day of his life, it is companion for his life and never can live without, that can’t be done without having the language by which he can communicate with individuals and society to achieve the required education. Language is a social and psychological phenomena with a high level of importance, it is the most human deed appeared of this planet, it works on develop the intellect and sense, plus it work on achieving psychological relief and comfort, by which the individual can express his sensations and excitements, this is the artificial occupation of the language, the first cast the ethics of the nations, beside it is an art helps the reader and the listener to think, and participates in enriching the phantasy and innovation, it is a system of symbols and voices that are pronounced and acquired used for communication, understanding and participation in transferring the meaning and sending the idea and has varied features and peculiarities, it is a means and a tool to transfer the cultures and Arabic

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language is one of them, it is the language of Holy Quran, the language of Arab who characterized with eloquence.

Arabic language is a live language undergoes to evolution, promotion, modification and development, new words have emerged and other old words disappear, sound and letters witnessed changing and modification, it is enriched with synonyms and contrasted words, diverse plurals, one of it’s characteristics is the briefing of expressions that reach to gesture or nod, other features of briefing is style of luring or warning, nouns of verbs, some sources, reading has a prominent position in the system of education Arabic language, it’s a key linguistic opening skill to another skills so no one can learn a language without learning reading skill, correct reading requires many mental operations like connection, balance and realization, understanding, assessment, regulation, deriving and inventing, reading understanding is the most important reading skills, one of the most important goals in teaching it, aims in all education stages to develop the ability to understand the printed material, it is the top of reading skills, basis of teaching it, helps in understanding the reading to connect among concepts and reach to classifications help in concluding the results and criticizing the reading material and that exceeding the general understanding that relies on realizing the whole expressions to understanding the meaning from the context of the sentence or expression and to the implicit understanding that exceeds the external meaning.

**Strategy of strategy of hearing-triangle:** It is the strategy of dividing the pupils into groups, each group consists of three pupils, first one explain the lesson or the idea or the concept, second one is a good listener, first one get asked for more clarification, third one observe the process and passing of the speech within his fellows and give a feedback for the lesson, the third pupil writes what the two other pupils read and be as a reference for them to mention that “ the first pupil says this and she says this.

**METODOLOGY**

Included procedures that were implemented to achieve the goal of the research starts from method of research and experimental design, specifying population of research and sample, equivalent of the two groups of the research (controlling and experimental), preparing requirements of research and its tools, procedures of application of the experiment and showing the statistical used means.

**Population of the research and its sample**

the current research community consists of primary grade pupils in the elementary schools belong to the state directorate of education in Babylon for the year of (2017-2018) that lies in Abi Gharaq district, after specifying the school to apply the study, it is Adan school that the researcher visited after having the permission by a formal letter from state directorate of education in Babylon, the school consisted of three sections, the researcher has chosen randomly section (c) to be the experimental group, and section (a) to be the controlling group, total number of two groups students was (66) female pupils, after excluding failed pupils of (5) pupils from both sections, to be (34) pupils in experimental group, (32) pupils in the controlling group.

**Equivalent of the two groups of the research:** the researcher has implemented a statistical equivalent between the two research’s groups (controlling and experimental) in some of the variables that influence upon the results of the experiment, in spite of choosing the two groups in a random withdrawing by the researcher and in spite of that the pupils of the sample are from the same economic and social level of living and they all study in the same school, and of the same sex but she insisted on performing the equivalence by the following variables ( age by months, education of parents, degrees of pupils in the second semester in Arabic language for the year (2017-2018) that the equivalences results between the two groups showed that the two research groups are equivalent by variables that have already mentioned, Table 1.

**Preparing the requirements of research** : research requirements are so important that research relies on, by which we can implement research procedures and represented by the following: (scientific material: identifying the scientific material that researcher teaches for the two groups pupils during the experiment time (second semester) of year (2017-2018), scientific material include subjects of second semester of the curriculum of Arabic language book, Casting the behavioral goals: the researcher has casted (80) behavioral goals depending on the general goals, the content of the subject that is included by the experiment, up to the classification of (Bloom) in the cognitive field distributed by the three levels (knowledge, understanding, application).
preparing the teaching plan: the researcher has prepared teaching plans for the subjects she studied within the period of the experiment, no of plans were (16) plan, she showed sample of them for some experts specialized in the field of teaching methods of Arabic language to make use of their opinions in validity of casting these plans and being in final status of good application and ready for use after listening for their notes.

Research’s tool: Testing the reading understanding: The test is an organized procedure to measure the changes that happened for the pupils after experiencing in specific teaching skills (kutamy, others: 271), there are many steps used to prepare the reading understanding represented by the following:

**Specifying the purpose of the research:** The wanted purpose of implementing this test is to measure the understanding of elementary school pupils in the subject of reading according to the behavioral goals were casted in the scientific material.

Specifying the goals of test: After determining the purpose of the research for the reading understanding, we specify the goals of test to know how much they are achieved, the researcher casted many behavioral goals.

**Specifying the items of the test:** the researcher performed the action of specifying the no. of items that form the test of reading understanding, test items were (24) item.

**Instructions of test:** Casting instructions and directions about how to reply represented by (choosing one sound alternative per item, replying all items, time of reply, writing whole name, class and section in appropriate place).

**Correcting the test answers:** After casting all items of test and choosing type of test, applying a criterion to correct answers, to apply (one degree per one correct test item for the 1st question, 2nd question, 3rd question and eight degrees for the 4th question), (zero for fault answer, the item that is not answered by the pupil, the item has more than one choice, consequently the final degree for the test of reading understanding is (30) degree and minimum degree is (zero).

**Truth of test:** Making sure of the external truth for the test and the truth of the content, results showed that the external truth achieved the rate of (80%) by the specialist judges, while for truth of the content, results showed that all the reading understanding items are a statistical function, so the test of reading understanding is considered truthful in measuring the extent of understand and comprehension of pupils.

**Reconnaissance application for the test:** Applying the test in its first reconnaissance stage over a group of pupils outside the individuals of the research sample, pupils were (30) pupil, the purpose is to identify the clearance of instructions and directions of the test and how much is the understanding and clearance of items of test for pupils and accounting the period of the tests, the researcher registered the time of dismiss for each pupil, determining the math. average of time, we found that the required time for answering all items of test is (40) minuet.

**Reconnaissance statistical application:** applying the test upon a sample of (100) pupil other from the research sample, in order to analyze the items of test statistically represented by the difficulty of the item, distinguishing of item and activity of fault alternatives.

**Statistical analyzing of the test items:**

Level of difficulty of the item: By applying the statistical analyzing of the test items, researcher found out that difficulty factor of items is bound with (0.32 – 0.62), then all items of test are considered good and their difficulty is appropriate.

Level of privilege of the item: It shows that test items have distinguishing power rate of (0.37 – 0.77).

Effectiveness of intact alternatives: After accounting the effectiveness of each incorrect alternative of each test item of the test items by using the equation of alternatives effectiveness, we found that more pupils were brought from the lower group compared with the pupils of upper group as fault values of alternatives range as (-0.11 - -0.37) so the researcher kept the alternatives without change.

**Stability of the test:** the test gives results is case it is applied for many times in similar conditions, to account the stability of the test, the researcher has used method of half parting, because this method is characterized with frugality in time required to apply test, it is implemented wholly, avoiding giving knowledge to pupils as we see in
the re-test method, the researcher depended on the degrees of individuals of the statistical analyzing and the items of research were divided into two halves, first half included the odd items degrees, second half included even items degrees and by using Pearson correlation coefficient as it is the most common coefficients in this field.

**Applying the research tool**: Notifying the two groups of research controlling and experimental of the date of application of the reading understanding test and the applying it after finishing teaching the specified material for the two groups in one time, supervision of the researcher on the process of application.

**Statistical means**: Researcher used (t-Test) for two independent samples to implement the equivalence between two groups (controlling and experimental) in the following variables (age by months, education for parents, scores of pupils for first semester).

**RESULTS AND DISCUSSION**

Excellence of experimental group pupils who studied up to the strategy of hearing-triangle upon the pupils of controlling group who studied by the ordinary method in test of reading understanding.

<table>
<thead>
<tr>
<th>Table 1. Equivalent of the two groups of the research.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Experimental</td>
</tr>
<tr>
<td>Controlling</td>
</tr>
</tbody>
</table>

**CONCLUSION**

Employment of strategy of hearing-triangle in the elementary education incites the desire of learnt and makes her excited to learn, and increases the mingling of the learnt in learning processes via executing questions, enrolling them, good listening, exchange of roles so that increase the amusement and pleasure for the learnt, this strategy had an active role in preparing of educative active environment through participation of the learnt and encourage them to teach themselves by themselves.

**Financial Disclosure**: There is no financial disclosure.

**Conflict of Interest**: None to declare.

**Ethical Clearance**: All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon Government, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

university.1991; 50.


Effectiveness of an Educational Program on Nurses Knowledge and Practices Concerning Hemodynamic Monitoring in Intensive Care Unit at Baghdad Teaching Hospitals

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ABSTRACT

The Study aims to evaluate the effectiveness of nursing educational program on nurse’s knowledge and practices concerning Hemodynamic monitoring in the Intensive Care Unit at Baghdad Teaching Hospitals. A quasi-experimental design study was conducted in Baghdad teaching hospitals from the period through September 2017 to July 4th, 2018. Non-probability (purposive) sample of (80) nurses who are working in the Intensive care units including the RCU and HDU. The results of the current study revealed that nurses who participated in education program demonstrated a greater knowledge level than the control groups in relation to hemodynamic monitoring. The effectiveness of educational programs regarding nurse’s practice toward hemodynamic monitoring had a positive effect on nurse’s practice as compared with a control group in relation to all hemodynamic monitoring domains. The study concluded that there was a positive effect of implemented an education program concerning hemodynamic monitoring.

Keyword: Effectiveness, Education Program, Knowledge, practices, hemodynamic monitoring

INTRODUCTION

The intensive care unit (ICU) receives patients who generally experience organ failure (single or multiple) or are at risk of such organ failure, which includes patients after major surgery and/or trauma. In hemodynamic instability, there is a mismatch between oxygen delivery and demand, which is a main leading factor for organ failure. Alterations in effective circulating volume (e.g., hypovolemia), cardiac function, and/or vascular tone (e.g., shock in sepsis) underlie hemodynamic instability. This condition can be managed with regular clinical examination and monitoring of certain basic vital parameters (heart rate, blood pressure, central venous pressure [CVP], peripheral and central venous oxygen saturation, and respiratory variables) and urine output¹. The hemodynamic monitoring is to characterize cardiovascular insufficiency and to treating all critical cases of the lurch critically ill in the intensive care unit.

Hemodynamic checking must to a diagnostic, therapeutic, and resuscitation aim important role. Although vital signs aid to measure the capability of tissue perfusion, they are a latish indicator of tissue ischemia, and Analysis of hemodynamic variables oversteps traditional vital signs allows the clinician to differentiate various reasons of hemodynamic predict and interfere appositely consists hemodynamic monitoring two method invasive & noninvasive method ³. Hemodynamic monitoring is a critical aspect in the care of the hypo perfused patient, present guides on cardiovascular physiopathology that indication of hemodynamic instability. It is significant to observed that hemodynamic monitoring is only a diagnostic device, and that it thus cannot advance the prognosis it is escorted by enough treatment measures gifted of refining the clinical course of the patient. Such treatment outcomes interventions correct in the interpretation of the data achieving, accurate timing of treatment and monitoring in the intensive care unit, has a very important step forward in our knowledge of cardiovascular function in the critically patient–permitting the fastness of intravascular pressures ⁴. Hemodynamic monitoring aims to have in the intensive care unit the care of critically to all patients is to
assess and ensure adequate tissue oxygen delivery and end organ perfusion. The most appropriate strategy, inappropriate volume expansion can lead to volume overload, pulmonary edema, worsening gas exchange, and acidosis. In the setting of chronic kidney disease, fluids volume management is further complicated by impaired kidney auto regulation as well as compromised free water and solute elimination. Several tools have been developed for use in clinical practice that may aid in determining hemodynamic status (Laurence, B. 2013).

**MATERIALS AND METHOD**

A quasi-experimental design is carried out to evaluate the effectiveness of an educational program on ICU nurses knowledge and practice concerning hemodynamic monitoring. The has been conducted in Baghdad Teaching Hospitals from, September 2017 to July 4th, 2018. Anon-probability (purposive) sample of (80) nurses who work in the intensive care unit in including the RCU and HDU., they selected from the Directorate of Medical City, Nursing Home Hospital, Ghazi AL Hariri Teaching Hospital and Baghdad Teaching Hospital, they were called to the regional center by sending official letters, through a schedule in the continuing education of nurses for the training. The sample divided in (40) ICU nurses for the case group, were exposed to the education program about hemodynamic monitoring, and (40) ICU nurses has been assigned to the control group who share the same criteria of selection for the study group and are not exposed to the educational program. The researcher observed and checked for applicable or non-applicable and then the practices as mean (3) or (2) applicable episodes were rated as always, (one) applicable practice was rated as sometime and non-applied practice rated as never. The cut of point was (2). The content validity of the program and the study tools are determined by the panel of (14) experts, who have more than 10 years, skill in their field to investigate the content of the educational program, the knowledge questionnaire and observational checklist about hemodynamic monitoring. The analysis of the data used was descriptive statistics and statistical inference, in order to find the differences between the study group and the control group. Data were analyzed through the use of SPSS application version 20. Descriptive data analysis, including Mean of score (M.S),with their Standard Deviation (S.D), and frequency (f). The inferential data analysis includes Chi-Square test, t-test, Analysis of Covariance (ANCOVA) test

**RESULTS AND DISCUSSION**

Table (1) displays the mean age for participants in the case group is (29.5 ± 8.26); most are within the age group of (20-29) years-old (n = 29; 65.0%), while the control group, the age mean is (31.8 ± 7.05) more than two-third are within the age group of (20-29) years-old (n = 17; 42.5%). The highest (63.3%) prevalence of nurses was male in the case group and (76.7%) in the control group. Concerning gender, participants are equally distributed in the case group (n = 20; 50.0%). For the control group, the highest prevalence were males (n = 24; 60%) compared to females(n = 16; 40.0%). Less of half nurses (n = 17; 42.5%) in the casegroup were a bachelor’s degree followed by those who hold an associate degree (n = 15; 37.5), and one who is nursing high school graduates (n = 11; 27.5%). For the control group, most nurses hold a bachelor’s degree (n = 24; 60.0%) followed by those who hold an associate degree (n = 12; 30.0%). With respect to the years of experience in ICU, most in the case group have (1-9) years (n = 30; 75.0%), while the control group, most have (1-4) years (n = 25; 62.5%). Regarding participation in training courses related to hemodynamic indicators, most in the case group have (1-2) courses (n = 26; 65.0%), while the control group, more than a half have (1-2) courses (n = 21; 52.5%). There is no statistically significant association was observed between the case and the control groups related age, gender, level of education, years of experience and participation in training courses. Table (2) shows that there is a high statistically significant difference in participants’ knowledge between groups from the pretest and posttest times (p-value = 0.001). Furthermore, there is a high statistically significant difference in participants’ practices between groups from the pretest and posttest times (p-value = 0.001). Table (3) showed that the posttest knowledge of the case group was better than that of the control group, there are statistically significant differences in participants’ knowledge in the posttest about hemodynamic monitoring, central venous pressure, blood pressure, pulse rate, and arterial blood gases (p-value = 0.001, 0.001, 0.001, 0.001, 0.001) respectively. Table (4) shows that the posttest practice of the case group was better than that of the control group, there are statistically significant differences in participants’ practices related to hemodynamic monitoring, pulse rate, central venous pressure, blood pressure, and arterial blood gases between the study and the control groupsat p-value <0.001. The mean age of participants in the case group was (29.57 ± 8.26); most
nurses were within the age group of (20-29) years-old. For the control group, the mean age was (31.80 ± 7.05); more than two-third were within the age group of (20-29) years-old. This finding could be explained as that the administration of the units from which the study subjects were recruited is recently deployed and such an administration hire newly graduated bachelor’s degree nurses who are already within the age group of (20-29). Furthermore, many nurses who work in these units ask to move to other units due to the tiresome and overloaded work at these units and the same wages as other nurses who work in other departments with less effort. This finding could be explained as that most of the participants were from the age group of (20-29) years-old. Regarding the level of education, most of the participants in both groups hold a bachelor’s degree. This result comes along with a study which revealed that the highest percentage (86.7%) was from bachelor’s degree this finding could be explained as that the officials in the Iraqi Ministry of Health emphasized to mainly recruit nurses who hold a bachelor’s degree to work in the intensive care units including the RCU and HDU. With respect to the years of experience in ICU, most nurses in the case and in the control groups have (1-9) years. Further cross-tabulation analysis revealed that all participants who have (1-9) years of experience in ICU are within the age group of (20-29) years-old. Regarding participation in training courses related to hemodynamic indicators, most of the participants in both groups have (1-2) courses, This reflects the officials’ greater interest in enhancing the staff’s competencies related to hemodynamic monitoring. With respect to the difference in participants’ knowledge between the case and the control groups in the post-test time, there were statistically significant differences in participants’ knowledge about hemodynamic monitoring, central venous pressure, blood pressure, pulse rate, and arterial blood gases (Table 3). This indicates the positive influence of the educational program in enhancing such knowledge. In assessing the critical care nurses’ knowledge and practice of invasive hemodynamic monitoring in Khartoum government hospitals, showed that availability of written protocols regarding invasive hemodynamic monitoring within ICUs was low, the overall knowledge of critical care nurses about invasive hemodynamic monitoring was not acceptable. And confirmed with a study that identify the technique of blood pressure monitoring is most important in the diagnosis and management, pulse rate, and arterial blood gases. The finding of present study were similar to findings reported by(10)(McGhee and Woods2001), which showed that most nurses (83.9%) did direct ABP monitoring. The total mean score of knowledge in the pilot findings was 36.7%. The results elicited from a study conducted on invasive intravascular hemodynamic monitoring technical issues who stated that physicians and nurses did not have a strong knowledge of the principles of measurements and key factors in the use of transducers namely zeroing, levelling and calibrating. An understanding of the concept of transmural pressure is the key to avoid many potential artefacts related to variations in pleural pressure. The present study showed that there were statistically significant differences in participants’ knowledge between the pretest and posttest related to hemodynamic monitoring, central venous pressure, blood pressure, pulse rate, and arterial blood gases to all domains. While, the control group, all domains showed no statistically significant differences in participants’ knowledge, except the knowledge about pulse rate between the pretest and posttest times. The nurses’ practice in pre observational check in present study was similar to findings of a study conducted in North America on hemodynamic monitoring in post-anesthesia care units to evaluate nurses’ skill and knowledge base in invasive hemodynamic monitoring, which showed that nurses’ lacked skills concerning invasive hemodynamic monitoring. Concerning the difference in participants’ practices between the case and the control groups in the post practice checklist, the practices of participants in the study group related to hemodynamic monitoring, pulse rate, central venous pressure, blood pressure, and arterial blood gases were noticeably improved as compared with the control group. This finding indicates the positive influence of the educational program in enhancing such practices. Regarding the difference in participants’ practices between the study and control groups between the pretest and posttest times, participants’ practices in the study group related to hemodynamic monitoring, pulse rate, central venous pressure, blood pressure, and arterial blood gases were remarkably improved. This finding indicates the positive influence of the educational program in enhancing such practices. Regarding the differences in participants’ practices between groups in terms of some variables, there were no statistically significant differences in participants’ practices among the groups of age, gender, level of education, years of experience in ICU, years of experience in nursing, and training courses.
Table 1. Participants Socio-demographic Characteristic:

<table>
<thead>
<tr>
<th>Sociodemographic Variables</th>
<th>Case group (n=40)</th>
<th>Control group (n=40)</th>
<th>$\chi^2$</th>
<th>df</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group (Years)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>20-29</td>
<td>26</td>
<td>17</td>
<td>5.171</td>
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<td>NS</td>
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<td>30-39</td>
<td>8</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40-49</td>
<td>6</td>
<td>8</td>
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<tr>
<td>Mean (SD)</td>
<td>29.57±8.26</td>
<td>31.8±7.053</td>
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<td></td>
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<td>Gender</td>
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<td>Level of Education</td>
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<td>Bachelor’s degree</td>
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<tr>
<td>1-9</td>
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<td>10-19</td>
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<td>20-29</td>
<td>8</td>
<td>3</td>
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<tr>
<td>Years of service in nursing</td>
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<td>11-20</td>
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<tr>
<td>21-30</td>
<td>5</td>
<td>3</td>
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<td>Training of courses</td>
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</table>

Table 2. Comparison of Pretest and Posttest Knowledge and Practices between the Study and Control Groups

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
<th>Group</th>
<th>N</th>
<th>Mean of score</th>
<th>SD</th>
<th>t-test</th>
<th>P-value</th>
<th>Sig</th>
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</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td>Control</td>
<td>40</td>
<td>62.85</td>
<td>2.44</td>
<td>-5.445</td>
<td>0.001</td>
<td>H.S</td>
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<tr>
<td></td>
<td></td>
<td>Case</td>
<td>40</td>
<td>59.90</td>
<td>2.72</td>
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<tr>
<td></td>
<td></td>
<td>Post-test</td>
<td>40</td>
<td>63.35</td>
<td>2.99</td>
<td>42.758</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>40</td>
<td>85.90</td>
<td>1.82</td>
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<tr>
<td></td>
<td></td>
<td>Case</td>
<td>40</td>
<td>85.90</td>
<td>1.82</td>
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<tr>
<td>Practices</td>
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<td>40</td>
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<td>-9.699</td>
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<td></td>
<td></td>
<td>Control</td>
<td>40</td>
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<td>2.40</td>
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<td></td>
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<td>2.40</td>
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<td>Posttest</td>
<td>40</td>
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<td>2.38</td>
<td>32.751</td>
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</tr>
<tr>
<td></td>
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<td>Control</td>
<td>40</td>
<td>88.18</td>
<td>4.86</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Case</td>
<td>40</td>
<td>88.18</td>
<td>4.86</td>
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</table>
Table 3. Comparison of posttest knowledge Score between the case and the control groups

<table>
<thead>
<tr>
<th>Knowledge domains (Number of question)</th>
<th>Group</th>
<th>N</th>
<th>mean± SD</th>
<th>t-test</th>
<th>df</th>
<th>p-value</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-hemodynamic monitoring(4 questions)</td>
<td>Case</td>
<td>40</td>
<td>7.62±0.490</td>
<td>11.89</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>6.22±0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-central venous pressure (12 questions)</td>
<td>Case</td>
<td>40</td>
<td>23.82±0.44</td>
<td>34.42</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>16.47±1.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-blood pressure (11 questions)</td>
<td>Case</td>
<td>40</td>
<td>20.77±0.76</td>
<td>35.091</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>15.30±1.04</td>
<td></td>
<td></td>
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<tr>
<td>4-Pulse rate (5 questions)</td>
<td>Case</td>
<td>40</td>
<td>9.62±0.58</td>
<td>11.504</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
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<td>7.27±1.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Arterial blood gases (13 questions)</td>
<td>Case</td>
<td>40</td>
<td>18.15±1.65</td>
<td>24.631</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>16.52±1.56</td>
<td></td>
<td></td>
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</tr>
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</table>

Table 4. Comparison of Post-test Practice between the case and the Control Groups

<table>
<thead>
<tr>
<th>Scores of the practices (number of items)</th>
<th>Groups</th>
<th>N</th>
<th>Mean (SD)</th>
<th>t-Test</th>
<th>df</th>
<th>p-value</th>
<th>Sig</th>
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</thead>
<tbody>
<tr>
<td>1-hemodynamic monitoring (5 items)</td>
<td>case</td>
<td>40</td>
<td>13.35±0.73</td>
<td>18.443</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>9.70±1.06</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-pulse rate (5 items)</td>
<td>case</td>
<td>40</td>
<td>12.60±1.12</td>
<td>16.295</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>8.60±0.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-central venous pressure (8 items)</td>
<td>case</td>
<td>40</td>
<td>20.02±1.56</td>
<td>18.721</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>13.15±1.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-blood pressure (5 items)</td>
<td>Control</td>
<td>40</td>
<td>12.40±2.98</td>
<td>13.451</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td></td>
<td>case</td>
<td>40</td>
<td>5.80±0.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-practice arterial blood gases total)</td>
<td>Control</td>
<td>40</td>
<td>20.45±1.70</td>
<td>9.943</td>
<td>39</td>
<td>0.001</td>
<td>H.S</td>
</tr>
<tr>
<td>items)</td>
<td>case</td>
<td>40</td>
<td>17.10±1.19</td>
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</table>

CONCLUSION

Effectiveness of the education program for nurses knowledge score between pre and post-test. Nurses who participated in education program demonstrated higher mean of score in knowledge than the control groups related to the hemodynamic monitoring. The application of education program has a positive impact on the overall practices of the case nurses than the control groups in application practices related to the concerning hemodynamic monitoring, pulse rate, arterial blood gases, central venous pressure, and measure and record of Blood pressure.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Adult Nursing Department, College of nursing, University of Baghdad, Baghdad city, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

1. Teboul JL, Saugel B, Cecconi M. Less invasive


Violence among High School Female Students in Baghdad City

Hawraa K Abed-Ali1, Wissam J Qassim2

1 Department of Community Health Nursing, College of Nursing, University of Baghdad, Baghdad City, Iraq, 2Head of Department of Community Health Nursing, College of Nursing, University of Baghdad, Baghdad City, Iraq

ABSTRACT

This study aims to determine the level of emotional, physical, and verbal violence among students, identify the association between student’s age and type of school violence, and investigate the differences in types of school violence between the groups of classes, school environment, watching TV program or social media that include violent scenes. A descriptive correlational design has been conducted in this study. The study sample included a non-probability “purposive” sample of (300) female student; (150) students were selected from each side of Baghdad City. The study instruments consisted of two major parts. The first part focuses on students’ socio-demographic characteristics. The second part investigates the types of school violence. The data were analyzed by using two statistical approaches: Descriptive and Inferential statistics. The study revealed that the majority of participants experience a low level of emotional violence, the majority of participants experience a low level of physical violence, and most of participants experience a low level of verbal violence. There were statistically significant associations between participants’ age, number of the students in the class, and the level of exposure to emotional violence, physical violence, and verbal violence.

Keywords: Violence, High School Female Students.

INTRODUCTION

School violence, which includes physical, psychological and sexual violence and bullying, occurs in all countries the root causes include gender and social norms and wider structural and contextual factors such as income inequality, deprivation, marginalization and conflict. It is estimated that 246 million children and adolescents experience school violence in some form every year 1. Violence is a serious issue and major cause of morbidity and mortality among adolescents and young adults all over the world. Violence related behaviors such as fighting and carrying weapons may lead to serious physical and psychosocial consequences for adolescents. Violence-related deaths in schools have been an emerging issue over the last 2 decades. Regardless of the cultural or socioeconomic context of the school, violence occurs in both physical and psychological forms. The World Report on Violence against Children identifies the main forms of violence as follows: physical and psychological punishment; bullying; sexual and gender-based violence; external violence; effects of gangs, conflict situations, weapons and fighting 1. School violence can occur inside and outside the classroom, around schools, on the way to and from school, as well as online In school, violence occurs in places such as toilets, changing rooms, corridors and playgrounds where children and adolescents are less easily be seen or supervised by teachers and other school staff 4. Attempts to humiliate belittle and control the other person. Teasing the victim in a mean way, insulting and humiliating the victim; giving the victim mean nicknames; teasing the victim about his/her appearance, handicap, physical difference or clothes; uttering threats against the victim’s parents, siblings or friends; laughing at the victim’s gender, sexual orientation or ethnicity; embarrassing the victim by verbal provocation; harassing or ridiculing the victim 5. Students may leak their violent intentions through boasting comments, essays, letters, Internet postings, or other forms of self-expression. Leakage can be an indicator of a personal psychosocial crisis with negative psychosocial, emotional, or developmental consequences. However,
leakage does not necessarily lead to a violent act but presents an opportunity for detecting students who need attention and support, provided that significant persons in the student’s environment recognize these warning behaviors and take appropriate action to investigate the situation and provide assistance.  

**MATERIALS AND METHOD**

A descriptive correlational design was used to assess high schools females about violence among high schools female students in Baghdad City. This study was started from October 15th, 2017 to April 30th, 2018. A purposive “Non-probability” sample of (300) female students were selected. These female students study at school, (150) female students from Al-Russafa side and (150) female students from Al-Karkh side. The study instrument includes the sociodemographic sheet, exposure to violence Scored assess high school females about Violence are rated on three levels type Likert scale range from 1 to 3; of Always =3, Sometimes =2 and Never=1. The content validity of the adopted questionnaire was determined through a panel of (15) experts to investigate the content of the questionnaire different specialties related to the field of the present study. They were asked respectively to review the questionnaire for clarity and adequacy in order to achieve the present study objective. The reliability for constructed questionnaire was determined by using pilot study. A pilot study was carried out for the period from the February 18th 2018 to February 28st 2018, and conducted at (16) high school female students; (8) students from Al-Rusafa side, and (8) students from Al-Karkh side. The pilot study sample was excluded from the original sample of the study. The internal consistency reliability of the instrument is determined through split-half technique and the computation of Cornbrash’s Alpha Correlation score of 0.80 t. Such Correlation Coefficient is obtained through the application of Statistical Package for Social Science Program (IBM SPSS) version 24.0. Data were analyzed by using the descriptive statistics (Standard deviation and Mean of Scores) and inferential statistical measures (Kruskal-Wallis Test and Mann-Whitney U test.

**RESULTS AND DISCUSSION**

Table (1) shows the demographic characteristics of the study sample which was The age mean is 16.9 ± 1.2; more than a third age 17 years (n = 104; 34.7%) More than two-fifth reported that they have 2-3 brothers (n = 131; 43.7%) The number of the students in the class mean is 36.4 ± 8.8; more than two-thirds described the school as fair (n = 129; 43.0%) Concerning the level of education, less than a third of mothers are high school graduates (n = 91; 30.3%) Regarding fathers’ level of education, less than a third reported that their fathers hold a bachelor’s degree (n = 98; 32.7%) Ultimately, less than two-fifth reported that the family income of their families is equal to or more than 901.000 ID (n = 112; 37.3%). There is an inverse statistically significant correlation between students’ age and their exposure to physical violence (r = -.142; at p-value < 0.05). Moreover, there are statistically inverse correlations between number of students in the class and each of the emotional violence, physical violence, and verbal violence (r = -.153; at p-value < 0.01; r = -.228; at p-value < 0.01; r = -.185; at p-value < 0.01). Participants who are in the fifth class experience the greatest amount of emotional violence, followed by those who are in the fourth class, and those who are in the sixth class. This represents a descending order. There is a statistically significant difference in the emotional violence among class groups (Chi-square = 10.791, df = 2, p-value = .005). Participants who are in the fifth class experience the greatest amount of verbal violence, followed by those who are in the fourth class, and those who are in the sixth class. This represents a descending order. There is a statistically significant difference in the verbal violence among class groups (Chi-square = 11.174, df = 2, p-value = .004). Participants who described their school environment as very poor experience the greatest amount of verbal violence, followed by those who described such an environment as poor, those who described it as excellent, those who described it as fair, and those who described it as good. This represents a descending order. There is a statistically significant difference in the exposure to verbal violence among school environment (Chi-square = 12.626, df = 4, p-value = .013). Participants who reported that they watch TV programs or social media that include violent scenes experience a greater amount of emotional violence than those who do not watch such programs. This represents a descending order. There is a statistically significant difference in the exposure to emotional violence between watching TV programs or social media that include violent scenes groups (Mann-Whitney U = 8342.000; p-value =.000). Participants who reported that they watch TV programs or social media that include violent scenes experience a greater amount of physical violence than those who do not watch such
programs. This represents a descending order. There is a statistically significant difference in the exposure to physical violence between watching TV programs or social media that include violent scenes groups (Mann-Whitney U = 8819.500; p-value = .004). The age mean is 16.9 ± 1.2; Analysis of such characteristics reveals that the majority more than a third age 17-years, followed by those who age 16 years (Table 1). There were statistically significant associations between participants’ age and each of the emotional violence, physical violence, and verbal violence. Further analysis demonstrated that students in the fourth stage; who are younger in age, perpetrate a greater amount of bullying. Furthermore, the larger class size implies a higher student-teacher ratio in which the teacher’s control over the class would be poorer and could create unfavorable learning environment that could help in evolving of bullying (Table 2). Participants who are in the fifth class perpetrate the greatest amount of emotional violence followed by those who are in the sixth class, and those who are in the fourth class (Table 3). This could be explained as that fourth-class students can be less familiar to the school environment as they recently moved from the middle school to the high school. Fifth-class students may be more familiar with school environment and their curriculum could offer them more leisure time in which they can bully other students. There was a significant association between school connectedness and ever having been in a fight (Ethier, Harper & Dittus, 2018). Participants who reported that they watch TV programs or social media that include violent scenes both perpetrate and experience the greatest amount of emotional violence than those who do not watch such programs. Literature relevant to violence indicates that watching violent materials on television influences the behavior of both children and adults. This finding is consistent with (Feshbach and Tangney, 2008) who found that individuals who watch violent scenes on television are more prone to behave aggressively. Participants who reported that they watch TV programs or social media that include violent scenes experience a greater amount of verbal violence than those who do not watch such programs. This represents a descending order. There is a statistically significant difference in the exposure to verbal violence between watching TV programs or social media that include violent scenes groups (Chi-square = 11.174, df = 2, p-value = .004). This could be explained as that fourth-class students can be less familiar to the school environment as they recently moved from the middle school to the high school. Fifth-class students may be more familiar with school environment and their curriculum could offer them more leisure time in which they can bully other students. There was a significant association between school connectedness and ever having been in a fight. Participants who described their school environment as very poor experience the greatest amount of verbal violence, followed by those who described such an environment as poor, those who described it as excellent, those who described it as fair, and those who described it as good. This represents a descending order. There is a statistically significant difference in the exposure to verbal violence among school environment (Chi-square = 12.626, df = 4, p-value = .013). There was a significant association between school connectedness and ever having been in a fight (Ethier, Harper & Dittus, 2018). Participants who reported that they watch TV programs or social media that include violent scenes both perpetrate and experience the greatest amount of emotional violence than those who do not watch such programs. Literature relevant to violence indicates that watching violent materials on television influences the behavior of both children and adults. This finding is consistent with (Feshbach and Tangney, 2008) who found that individuals who watch violent scenes on television are more prone to behave aggressively. Participants who reported that they watch TV programs or social media that include violent scenes experience a greater amount of verbal violence than those who do not watch such programs. This represents a descending order. There is a statistically significant difference in the exposure to verbal violence between watching TV programs or social media that include violent scenes groups (Mann-Whitney U = 8394.000; p-value = .001). This finding is consistent with Feshbach and Tangney (2008) who found that individuals who watch violent scenes on television are more prone to behave aggressively. Participants who reported that they play video games that include violent scenes experience a greater amount of physical violence than those who do not play such games. This represents a descending order.

<table>
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<th>Freq.</th>
<th>%</th>
</tr>
</thead>
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<td>11.3</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>70</td>
<td>23.3</td>
</tr>
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<td>17</td>
<td>104</td>
<td>34.7</td>
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<td>18</td>
<td>61</td>
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<td>19</td>
<td>25</td>
<td>8.3</td>
</tr>
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<td>20</td>
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<tr>
<td>Mean ± SD</td>
<td>16.9 ± 1.2</td>
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Table 1. Participants’ Sociodemographic Characteristics (N = 300)
### Table 1. Participants’ Sociodemographic Characteristics (N = 300)

<table>
<thead>
<tr>
<th>Number of brothers</th>
<th>None</th>
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<th>2-3</th>
<th>4-5</th>
<th>≥ 6</th>
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<tbody>
<tr>
<td></td>
<td>41</td>
<td>100</td>
<td>131</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Number of sisters</td>
<td>None</td>
<td>1</td>
<td>2-3</td>
<td>4-5</td>
<td>≥ 6</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>83</td>
<td>116</td>
<td>40</td>
<td>11</td>
</tr>
<tr>
<td>Number of the students in the class</td>
<td>Mean (SD) = 36.4 ± 8.8</td>
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<td></td>
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<tr>
<td>* How do you describe your school environment?</td>
<td>Very poor</td>
<td>19</td>
<td>6.3</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Poor</td>
<td>36</td>
<td>12.0</td>
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</tr>
<tr>
<td></td>
<td>Fair</td>
<td>129</td>
<td>43.0</td>
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</tr>
<tr>
<td></td>
<td>Good</td>
<td>106</td>
<td>35.3</td>
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</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>10</td>
<td>3.3</td>
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<td></td>
</tr>
<tr>
<td>Do you watch TV programs or social media that include violent scenes?</td>
<td>Yes</td>
<td>124</td>
<td>41.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>176</td>
<td>58.7</td>
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<td></td>
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<tr>
<td>Do you play video games that include violent scenes?</td>
<td>Yes</td>
<td>78</td>
<td>26.0</td>
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</tr>
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<td></td>
<td>No</td>
<td>222</td>
<td>74.0</td>
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### Table 2. Correlation between Students’ Age, Number of Brothers, Number of Sisters, and Types of School Violence

<table>
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<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
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<tr>
<td>1. Age</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of brothers</td>
<td>.023</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of sisters</td>
<td>.043</td>
<td>.130*</td>
<td></td>
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<td></td>
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<tr>
<td>4. Number of the students in the class</td>
<td>- .271**</td>
<td>.188**</td>
<td>.166**</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Emotional Violence</td>
<td>-.036</td>
<td>-.061</td>
<td>.013</td>
<td>-.153**</td>
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<tr>
<td>6. Physical Violence</td>
<td>-.142*</td>
<td>-.073</td>
<td>-.025</td>
<td>-.228**</td>
<td>.438**</td>
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<tr>
<td>7. Verbal Violence</td>
<td>-.096</td>
<td>-.038</td>
<td>-.005</td>
<td>-.185**</td>
<td>.684**</td>
<td>.515**</td>
<td>-</td>
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Table 3. Difference in the Exposure to Types of School Violence among Class Groups

<table>
<thead>
<tr>
<th>Ranks</th>
<th>Class</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
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<tbody>
<tr>
<td></td>
<td>Emotional Violence</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Fourth</td>
<td>100</td>
<td>154.29</td>
<td></td>
<td>10.791</td>
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<td>.005</td>
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<td>Fifth</td>
<td>100</td>
<td>128.86</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>100</td>
<td>168.36</td>
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</tr>
<tr>
<td>Total</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Violence</td>
<td>Fourth</td>
<td>100</td>
<td>161.19</td>
<td></td>
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<td>.278</td>
</tr>
<tr>
<td>Fourth</td>
<td>100</td>
<td>161.19</td>
<td></td>
<td>2.563</td>
<td>2</td>
<td>.278</td>
</tr>
<tr>
<td>Fifth</td>
<td>100</td>
<td>142.93</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>100</td>
<td>147.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Verbal Violence</td>
<td>Fourth</td>
<td>100</td>
<td>156.95</td>
<td></td>
<td>2</td>
<td>.004</td>
</tr>
<tr>
<td>Fourth</td>
<td>100</td>
<td>156.95</td>
<td></td>
<td>11.174</td>
<td>2</td>
<td>.004</td>
</tr>
<tr>
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<td>100</td>
<td>127.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>100</td>
<td>166.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>300</td>
<td></td>
<td></td>
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</tbody>
</table>

Table 4. Difference in the Exposure to Types of School Violence among School Environment Groups.

<table>
<thead>
<tr>
<th>Ranks</th>
<th>How do you describe your school environment?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emotional Violence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor</td>
<td>19</td>
<td>86.76</td>
<td></td>
<td>27.721</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Poor</td>
<td>36</td>
<td>112.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>129</td>
<td>147.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>106</td>
<td>176.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>10</td>
<td>173.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Violence</td>
<td>Very poor</td>
<td>19</td>
<td>119.53</td>
<td>6.821</td>
<td>4</td>
<td>.146</td>
</tr>
<tr>
<td>Very poor</td>
<td>19</td>
<td>119.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>36</td>
<td>134.43</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fair</td>
<td>129</td>
<td>150.74</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Good</td>
<td>106</td>
<td>157.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>10</td>
<td>189.90</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Violence</td>
<td>Very poor</td>
<td>19</td>
<td>100.71</td>
<td>12.626</td>
<td>4</td>
<td>.013</td>
</tr>
<tr>
<td>Very poor</td>
<td>19</td>
<td>100.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>36</td>
<td>133.01</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fair</td>
<td>129</td>
<td>148.50</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Good</td>
<td>106</td>
<td>168.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>10</td>
<td>142.15</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 5. Difference in the exposure to emotional violence between watching TV programs or social media or Playing Video Games that include violent scenes groups

<table>
<thead>
<tr>
<th>Ranks</th>
<th>Watching TV programs or social media that include violent scenes?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann- Whitney U</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotional Violence</strong></td>
<td>Yes</td>
<td>124</td>
<td>129.77</td>
<td>16092.00</td>
<td>8342.00</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>176</td>
<td>165.10</td>
<td>29058.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Violence</strong></td>
<td>Yes</td>
<td>124</td>
<td>133.63</td>
<td>16569.50</td>
<td>8819.50</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>176</td>
<td>162.39</td>
<td>28580.50</td>
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<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verbal Violence</strong></td>
<td>Yes</td>
<td>124</td>
<td>130.19</td>
<td>16144.00</td>
<td>8394.00</td>
<td>.001</td>
</tr>
<tr>
<td></td>
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<td>176</td>
<td>164.81</td>
<td>29006.00</td>
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<tr>
<td></td>
<td>Total</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ranks</th>
<th>Playing video games that include violent scenes?</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann- Whitney U</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotional Violence</strong></td>
<td>Yes</td>
<td>78</td>
<td>138.60</td>
<td>10810.50</td>
<td>7729.50</td>
<td>.156</td>
</tr>
<tr>
<td></td>
<td>No</td>
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<td>154.68</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Violence</strong></td>
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<td>10437.50</td>
<td>7356.50</td>
<td>.042</td>
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<tr>
<td></td>
<td>No</td>
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<td>156.36</td>
<td>34712.50</td>
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</tr>
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<td></td>
</tr>
<tr>
<td><strong>Verbal Violence</strong></td>
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<td>139.69</td>
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<td>7815.00</td>
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<td>Total</td>
<td>300</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**CONCLUSION**

The study revealed that the majority of participants experience a low level of emotional violence, the majority of participants experience a low level of physical violence, and most of participants experience a low level of verbal violence. There were statistically significant associations between participants’ age, number of the students in the class, and the level of exposure to emotional violence, physical violence, and verbal violence.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of community Health Nursing, College of Nursing, University of Baghdad, Baghdad city, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


TIMSS-Standard-Based Content Analysis of the Physics Book for the Third Grade of the Secondary School: Completely Build the Psychological, Physical, Mental, and Social Individual Components

Noor Kadhim AL-Asadie¹, Wafa’a Abd Alrazaq AL-Ambakie¹, Muhammad Hadi AL-Shemarie¹
¹Department of Sciences, College of Basic Education, University of Babylon, Iraq

ABSTRACT

Education is well-known as a developed dynamic process that tries to typically and completely build the psychological, physical, mental, and social individual components to be a helpful member in his or her community. The current analytic study was performed to analyze the physics book for the third grade of the secondary school, Iraq. The work was done according to Trends in International Mathematics and Science Study (TIMSS) standards. TIMSS-standard-based descriptive analyses were used to evaluate the book. The results of the present study were varied in which the book contents were compatible with the TIMSS standards at (17.2%). However, each subject in the book showed different degree of compatibility with these standards.

Keywords: Content analysis, science book, secondary school third grade.

INTRODUCTION

The recent decades are characterized by the domination of science and technology in which many theoretical and applied scientific technologies are increasingly being discovered. These processes have their own impacts on the lifestyles of scientific and non-scientific communities. Nowadays, people keep using technologies in different subjects of their daily basis needs such as the use of TV panels, highly sophisticated computers and their software applications dominated by internet, and the use of genetic engineering applications. Therefore, science is considered as the most important tool and aim for this life ¹. In all scientific and technological development around the world, education is considered the main factor that affects this process. Moreover, education provides the power for people to acquire and develop their skills plus adopting environmental awareness and positive thought ², ³. In addition, education is well-known as a developed dynamic process that tries to typically and completely build the psychological, physical, mental, and social individual components to be a helpful member in his or her community ⁴, ⁵.

School curricula include series of connected functional elements that work together to result in a proper scientific curriculum. A curriculum typically contains elements of objectives, content, teaching methods, educational tools, activities, and evaluation. These elements are important in the developing contents of curriculum in any school grade ⁶, ⁷. Developing curricula for the schools in Iraq becomes big necessity to fulfill the new requirements when developing school subjects especially introducing modern technologies in different aspects of the life ⁸, ⁹. For school books, they act as important player in developing these curricula and providing the accurate education to students leading to fulfill the objectives of these curricula ¹⁰, ¹¹. A successful school book needs to be analyzed descriptively for its contents and elements and discovered for the beneficial links between these elements for better development of educational curricula ¹²-¹⁴. According to the importance of the physics science, the developed countries keep working on providing this science to their generations in a developed and
modernized ways to help their communities reaching the satisfaction in their life needs. For all the mentioned above plus the importance of physics science, this study was initiated to answer the question about the contents of physics book for the third grade of the secondary school in Iraq and their compatibility with TIMSS standards. The definition of content analysis is one of the scientific research tools, one of the descriptive research curricula, that aims at knowing the communication characteristic or school books. It also describes these characteristics using quantitative symbols plus using any data obtained from different tools to fulfill the requested development.

The TIMSS is a global study that aims at comparison and evaluation of the educational system achievements from mathematics and sciences from countries around. This is performed under the supervision of the International Association for the Evaluation of Educational Achievement (IEA). The current work is similar to the variables from the analytic study was performed to analyze the physics book for the third grade of the secondary school, Iraq. The work was done according to TIMSS standards and comparing this work data to studies from UAE and USA.

**METHODOLOGY**

The current analytic study was performed to analyze the physics book for the third grade of the secondary school, Iraq. The work was done according to TIMSS standards. TIMSS-standard-based descriptive analyses of the contents were used to evaluate the book. The book for this grade was from 2016-2017. Here, we used a tool that was based on TIMSS standards and contained reviewing these standards plus consulting psychologists and teaching methodologists. According to these, we considered using 81 criteria in 6 subjects. The principles used in the descriptive analyses were 1) reading the physics book completely, 2) using single variable for each subject in collecting iterations for that variable, 3) evaluating the book chapters with the used criteria, 4) continuing of the study from December 22, 2017 to January 10, 2018, 5) placing the results of the content descriptive analyses in a table in which (X) refers to the presence of the criterion in the book and (-) refers to the absence of any criterion in that book, and 6) converting the results into quantitative data to ease the statistical analyses (calculating of iterations and percentages). The used statistics in this work were Cooper Equation for the stability of the results and calculating the percentages of the samples via the use of the iterations and the percentage for each criterion.

**RESULTS AND DISCUSSION**

The results of the content descriptive analyses for the physics book, 8th print, for the third grade of the secondary school, Iraq, are shown in the table. The results showed that the book provided compatibility with TIMSS standards at only 14 (17.2%) out of 81 items of the book. These results revealed that the book didn’t apply the global requested criteria for producing a good physics book for the third grade students of the secondary schools in Iraq. The results also showed failing of the responsible officials in piling the book using information that should be used in the physics books for the 1st and 2nd grades in those schools for better gradual learning. The book should be compatible with the TIMSS standards. The information provided in the book should be compatible with the mental levels of the students in those grades. The book also should have information about developing strong individual mental skills.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Iterations</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification of matter and its characteristics</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Illustrate of matter states and their differences</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Description the processes of evaporation, condensation, melting, and freezing via the changes in the matter status</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Description of objects and matters according to their physics</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Detecting the visual changes in the matter via the effects of factors such as decomposition, burning, rust, etc.</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 1. Analyses for the physics book, 8th print, for the third grade of the secondary school, Iraq

<table>
<thead>
<tr>
<th></th>
<th>Analysis</th>
<th>Compatibility</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>Water property description</td>
<td>0%</td>
</tr>
<tr>
<td>6</td>
<td>Detection of water states as solid, liquid, and gas.</td>
<td>0%</td>
</tr>
<tr>
<td>7</td>
<td>Classification of water- and non-water dissolved substances</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>Description of mixture examples and using physics in their separation</td>
<td>0%</td>
</tr>
<tr>
<td>9</td>
<td>Atom definition</td>
<td>0%</td>
</tr>
<tr>
<td>10</td>
<td>Molecule definition</td>
<td>0%</td>
</tr>
<tr>
<td>11</td>
<td>Differentiation between atom and molecule</td>
<td>0%</td>
</tr>
<tr>
<td>12</td>
<td>Differentiation the movement style of molecules in solid, liquid, and gas states</td>
<td>0%</td>
</tr>
<tr>
<td>13</td>
<td>Explanation the physics of solid, liquid, and gaseous substances</td>
<td>0%</td>
</tr>
<tr>
<td>14</td>
<td>Explanation the relationship between temperature changes for gases and their changes in sizes and pressure.</td>
<td>0%</td>
</tr>
<tr>
<td>15</td>
<td>Explanation the relationship between temperature changes for gases and the movement average of their molecules</td>
<td>0%</td>
</tr>
<tr>
<td>16</td>
<td>Explanation the relationship between temperature changes for gases and the distances between their molecules</td>
<td>0%</td>
</tr>
<tr>
<td>17</td>
<td>Description of melting</td>
<td>0%</td>
</tr>
<tr>
<td>18</td>
<td>Description of freezing</td>
<td>0%</td>
</tr>
<tr>
<td>19</td>
<td>Description of boiling</td>
<td>0%</td>
</tr>
<tr>
<td>20</td>
<td>Description of evaporation</td>
<td>0%</td>
</tr>
<tr>
<td>21</td>
<td>Description of sublimation</td>
<td>0%</td>
</tr>
<tr>
<td>22</td>
<td>Description of the changes in the physics factors such as the surface and the temperatures in the surrounding of substances</td>
<td>0%</td>
</tr>
<tr>
<td>23</td>
<td>Explanation the temperature stability on the processes of freezing, melting, and boiling.</td>
<td>0%</td>
</tr>
</tbody>
</table>

CONCLUSION

The results of the present study were varied in which the book contents were compatible with the TIMSS standards at (17.2%). However, each subject in the book showed different degree of compatibility with these standards. The information provided in the book should be compatible with the mental levels of the students in those grades. The book also should have information about developing strong individual mental skills.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Sciences, College of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

1. Rull V. The most important application of science: As scientists have to justify research funding with potential social benefits, they may well add


The Strategy Effect of Successful Intelligence in the Student’s Achievement of the Third Grade of the College of Education Curriculum and Teaching Methods

Mohamed Kazem Mintoub¹, Firas Tarad Ali¹
¹College of Basic Education, University of Babylon, Hillah city, Iraq

ABSTRACT

The research aims to identify the impact of the strategy on successful intelligence in the achievement of third graders. In the college of Education curriculum and teaching methods. In order to achieve this, the researcher used experimental design with a partial uncontroled consisting of two groups, one is experimental and the other is uncontrooled. The researcher chose the University of al-muthanna, college of education, department of history, as a place to conduct the experiment. The sample consisted of (82) students, 42 students, (40) students. In a randomized way, classroom (B) was chosen as a pilot group to study the successful intelligence strategy and the uncontroled group was taught in the usual way. In addition to the objective of the research, the researcher prepared a multivariate selection test. The validity of the test and its stability, as well as the statistical analysis of its vertebrates, were verified. The results showed that the experimental group (T-test) exceeded the experimental group, which was tought according to the successful intelligence strategy on the uncontroled group, which was tought in the normal way. The use of successful intelligence strategy in other variables, such as critical thinking, creative thinking, visual thinking, visual perception.

Keywords: successful intelligence, achievement, curriculum and teaching methods.

INTRODUCTION

Successful intelligence is one of the key cognitive processes that can outweigh information and knowledge in facilitating the adaptation and uncontroled of individual resources and resources within the context of the learner in different life situations, whether these resources are in the form of information, experiences or tools available in the learner’s daily life situation. The need for successful intelligence is evident in our time; as a result of the rapid development of information and the vast amount of knowledge that the human mind cannot bear ¹. Therefore, many educators and specialists in education and psychology called for overcoming the difficulties resulting from this scientific development in all situations, whether academic or daily life, so that the main objective is how to manage information and benefit from it through effective thinking and proficiency in order to raise the efficiency of the learner in the face of The problems of the present and the future and enable it to challenge ambiguity and surprises, and increase its ability to adapt to the surroundings and the environment in which he lives ². Therefore, the value of the learner should be increased and should be benefited from the information he has in order to point out to him as a successful and earner intelligent, which leads to the achievement of effective and continuous learning, and push him to deal with situations in accordance with its circumstances, and support individuals in life situations, enabling them to adapt to the life situation in order to solve their problems , It is a guiding basis for effective and functional performance ³. So that individuals need to use these skills together to be successful individuals in life, and that many methods of teaching develops the intelligence of individuals in one area only is analytical intelligence, and gives less

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importance and less emphasis on the areas of creative intelligence and practical necessary for success in life, the use of analytical thinking and creativity and practical lead to successful intelligence, so discrimination in anyone of these capacities may not be sufficient for success. Teaching for successful intelligence involves a way of looking at the learning process as expanding the types of activities and assessments of the teacher. This does not negate the presence of many good teachers who are studying for successful intelligence automatically, but many are not taught in this way, teaching for successful intelligence involves the use of a range of activities and goals that develop analytical, creative and practical thinking, as well as memory-based learning. Sternberg and Gregorinko have noted that teaching successful intelligence leads to improved performance even when teaching and evaluation rely directly on information recall. The human brain is one of the important and vital topics that occupied most researchers and scientists because it is related to various academic, social, technical, professional and other fields. The human brain, which is the core of the central nervous system, is very complex in structure, humanity is only thanks to the brain, and the important aspect of the functions of that ability is intelligence. It provides the analytical intelligence of the individual to examine and select the skills that will solve the problem. Creative intelligence demonstrates the ability of the individual to think positively and independently based on his previous knowledge to complete his target task. The practical intelligence shows the individual’s ability to benefit from his previous or acquired knowledge and employ them to achieve success. In his environment and daily life, the individual deals with successful intelligence. He can analyze the problem, find a solution, and implement the solution. Thus, the importance of successful intelligence is that it develops an individual’s ability to adapt to changing, unique and new circumstances, because successful intelligence is the ability to learn and think through previously discovered models and relationships to solve new problems in unfamiliar contexts. The practical ability is to translate the theory into the practice and translation of abstract ideas into concrete work. The implications of the theory of investment in creativity suggest that good ideas do not market themselves, but the creative person uses practical abilities to convince others that the idea is worthwhile. The process enables us to distinguish ideas that have acceptance in others.

**METHODOLOGY**

Experimental design the choice of experimental design suitable for the phenomenon to be studied in research is necessary to reach answers to the hypotheses of research and contribute to the experimental uncontroled of research and serve as a program of work for how to implement the experiment and to plan the circumstances and factors surrounding the phenomenon studied and observed. The Research society and its entity: The current research community consists of all third grade students / history department / college of education / Al-muthanna University for the academic year 2017-2018 and all third grade students / history department / College of education / Qadissiya University. (400) students. The researcher chose the third grade / history students in the college of education / Al-muthanna university as a sample of his society. He chose the simple random way classroom (B) to represent the experimental group that will study according to the strategy of intelligence success (42) students, and chose classroom (A) to represent the uncontroled group that will study according to the traditional way without being exposed to the independent variable. The number of students has reached (40) students after excluding the tow students from last year. The equality of the two groups: Prior to the experiment, the researcher was keen to conduct an equalization of the two sets of research (uncontrolled and experimental) in aspesitic time, the educational achievement of the educational materials and the educational achievement of the parents and the degree of intelligence. Research requirements: determination of the scientific article. The researcher has identified the scientific material that he will study for the students of the two research groups in the academic year (2017 - 2018) according to the elements of the syllabus and the methods of teaching the course for the third grade and in cooperation with the material teacher in the history department / The curriculum concept, the modern concept of the curriculum and the factors that contributed to the evolution of the curriculum, the foundations of the curriculum, the components of the curricula, the educational goals, the content, the methods of the curriculum, the evaluation and development of the curriculum, Teaching, General goals, goals interim behavioral goals, methods of teaching, planning teaching, how to prepare the plan. For the purpose of ascertaining their authenticity presented to the arbitrators with experience and competence and have expressed
The results showed that the experimental group was superior to the uncontrolled group in the collection. The use of the successful intelligence strategy had a positive effect in raising the level of student achievement. The successful intelligence strategy has allowed students to rely on themselves in terms of finding answers, which gave them a lot of fun at work, making the curriculum and teaching methods more vital. The superiority of the students of the experimental group is due to the fact that they are more receptive to the modern methods of teaching because their curiosity may lead them to explore new aspects of the curriculum in which they study curriculum and teaching methods, and encourage them to follow the lesson, which increases their understanding more than the traditional way. Previous studies have agreed with the current study on the use of the experimental approach. The study examined the impact of an educational program based on the theory of successful intelligence in developing the analytical, creative and practical abilities of the mentally gifted students and the impact of the educational program on students’ achievement in Arabic. The effectiveness of teaching based on the theory of successful intelligence and self-organized learning in the collection of biologe and the development of the cognitive competence of the students of the fifth science. The studies differed in their tools, such as the Sternberg tripartite test of abilities and Habib (2015) on the preparation of the achievement test and the cognitive awareness adequacy measure. The Jubilee scholl took (46) students, who participated in the study and some of the students of the fifth science Sana’a middle school for girls (95) students in the study. The current research was appointed by students of the college of Education. These studies are consistent with their findings, and the present study may or may not be consistent with previous studies on the effectiveness of successful intelligence strategy depends on the results to be reached by the researcher.

**CONCLUSION**

In light of the findings of the researcher can be...
concluded as follows: The use of a successful intelligence strategy based on the theory of successful intelligence in the teaching of curricular material and teaching methods can achieve the educational and behavioral goals required for students at this stage better than the usual methods; because it provides the learner with a general idea of the minutes of the subject to be studied and works to build an intellectual bridge between what he will learn, his cognitive structure and the educational situation, and provide the learner with the rules that enable him to link the previous information to the new and thus install and recall when needed. Teaching according to the strategy of successful intelligence is more effective than the usual way because it gives positivity to the learner in the educational situation, by raising the learner’s interest in the subject matter and make it in an unusual position in advance and freed from the obligations of the normal way.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Psychological Effects of Clickers Technology on English Language Students

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ABSTRACT

Clicker’s technology has been achieving a tremendous success all around the world in teaching by utilizing them as a classroom innovation. The presented study aims at investigating the psychological effects of clickers on English language students in an Iraqi setting. The study uses quantitative research method. The samples of the study were randomly selected from the fourth preparatory school students. The study adopted a pre-test treatment- post-test design and a satisfaction survey. The first hypothesis was accepted and was concluded that clicker’s technology classroom was better than the traditional teaching in both the overall achievement and vocabulary items acquisition. The study also concluded that the utilization of the Clickers technology has had a positive psychological effect on the learning experience of the students and that they would like for the implementation of the device to continue. Future studies could very well expand and support the findings of this study or yield different results.

Keywords: Clickers Technology, Psychological, Students

INTRODUCTION

The process of education and learning is developing at an increasing pace because of technological advancements in all of its aspects and fields and thus arise the need of innovation in the way we teach and interact with our learners. Learners today are driven and dictated by technology in their daily lives so firmly gripping the same old traditional teaching is not enough anymore, for we need to integrate technology and innovation into our teaching routine so that we can grasp the attention of learners towards the material being presented. One form of technology is Clicker devices which are being implemented all around the world right now and its use is increasing by the day in almost all levels of teaching and education. Studies on the device show promising results as they can enhance the dynamics of the classroom and making it more engaging and interesting. Caldwell (2007) concluded in his study that clickers indeed had an advantageous impact on student’s performance and that the technology proved to be more engaging and interesting to the students. Much of the success obtained from the clickers technology is reliant on the way they are utilized and the extent of their use in the classroom, for they can develop a more favorable environment within the classroom which in result can outright leverage the learning process. Presenting clickers as a way to monitor and present collaborative learning or peer instruction technique is really helpful especially in large classroom environments, in fact, pupils and teachers who have used this gadget are generally positive and enthusiastic because of the effects the device has on them. Likewise, instructors and experts stretch the tremendous ability of clickers in extending pupils’ learning. Clickers tend to be seen as an apparatus that can add to students’ motivation and engagement amid lessons and boost the students’ self-esteem which is a very desirable psychological effect. Classroom response system or clickers are gadgets being used as an easy assessment tool that provide the teacher with immediate feedback on the performance of his students in every lesson. They have been used for various purposes such as producing classroom discussion, executing peer-instruction technique, or taking absentees in a large lecture hall or

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classroom which is only a small number of the uses that the device offers. The gadget has three parts a receiver connected directly to a computer, a handheld remote that is given to the pupils to transmit their responses to the receiver through Bluetooth or Wi-Fi signal and a PC program that records understudies’ answers and analyzes them (Hatch, Jensen and Moore, 2005). The instructor is tasked to construct multiple questions related to the presented material and present them to his students. then the learners are required to press the right answer on the remote control. When voting is done the instructor will show the results for the class as (e.g. graphs, diagrams, visual bars or pie charts) to produce discussion, give input and decide whether his teaching style is effective or needs few adjustments or amendments (ibid).

Previously we have discussed the implementation of Clickers technology in an everyday instruction, we have encountered the term Peer instruction and the way it can influence the execution of clicker’s technology in the classroom and help in propelling better results. Now we are going to demonstrate the significance of the term and how we benefited from it in our experiment. It is an intuitive teaching technique proposed by Professor Eric Mazur in the late twentieth century. Mazur developed his model of this instructing strategy to try to help his understudies’ in applying their knowledge to practice. In Mazur’s technique, the teacher constructs various multiple-choice questions and ask his students to answer them at different time periods of the lesson. In the event that a large portion of the pupils’ answers was not right, they are requested to take the advice and discuss the possible answers with their peers until they reach an agreement over the right choice. Eric Mazur’s technique is based upon the presumption that students that have comparative levels of comprehension, could sometimes explain the material in a more suitable way than that of the teacher. Mazur believes that his technique applies well if students were preparing the material ahead of lessons and a short time later try to apply what they have studied in use, where there is ample opportunity for positive feedback from the teacher, classmates and themselves which can very well enhance their learning process (ibid). The concept of peer instruction was used by the researcher daily to test the students twice in each lesson by using Clickers devices to get an instant feel for class progress. A couple of studies proposed that clickers enhance understudies’ outcomes, for instance, tests marks, succeeding rates, learners’ observation and perception, and furthermore, that students appear to like clickers. Rohwer in his research specifies that the execution of the clicker technology incited a sensational increment in pupils’ enthusiasm for the class, as understudies were given a safe zone to answer questions without the dread of being embarrassed before their partners. This is especially proper in such a huge classroom environment, where it can be challenging to produce an intuitive discussion. In any case, to date, most of the researches done on the effects of clickers are not sufficient to permit legitimate choices about the benefits of clickers in the classroom. Researchers specialized in the field of education surmise that the coverage of content alone is not adequate enough to show how this dynamic engagement prompts more dependable learning. In this regard, the researcher tested the use of the clicker’s technology on students’ vocabulary acquisition to determine how viable the device is in an Iraqi setting.

**METHODOLOGY**

Includes a presentation of the procedures used to achieve the objectives of the study, starting from selecting the population and samples, neutralizing the variables of both samples, designing the instruments and tools of the study, conducting the experiment and analyzing the results.

**Experimental Research Design**

The experimental design contains one independent variable (Clickers technology) and a dependent variable (the test scores), thus the experimental design was adopted on two equivalent groups one experimental and the other is controlled.

**Population and Sampling**

The population of the presented study is represented by the fourth-grade preparatory school students in the province of Karbala for the educational year (2017-2018). Al Balagh preparatory school located at the heart of the province was chosen to represent both samples the control and the experimental one, which we randomly selected class (A, 37 students) to represent the experimental set that received Clicker based instruction and class (B, 39 students) to represent the control set which received traditional teaching.

**Samples Equivalence**

The researcher conducted a statistical equivalence
between the experimental and control groups in some variables that could affect the results of the experiment. Although the researcher chose the two groups randomly, the students of the research sample from similar social and economic status and study in one school. We were keen to make parity by making the equivalence between these variables (the age measured by months, first course scores, and parent’s academic achievement). The statistical results demonstrated that the two sets were equivalent in all the aforementioned variables.

Preparation of the Material

The teaching material that was used in conducting the experiment was represented by the English for Iraq syllabus and the content that was taught during the second course of the educational year (2017-2018) was set to be from (Unit 5- Unit8). In which the researcher set a number of behavioral objectives to be expected from the test sample, as for the lesson plans the researcher prepared a total of (30)lesson plan for each sample set based on the fourth preparatory grade book (English for Iraq).

Research Instrument

It is defined as the assessment of the knowledge of an individual in a particular area content area, skill or accomplishment in a particular curriculum, time frame, and material. They can also help in diagnosing the level of students and what they need to develop and work on (Brown.2003). the achievement test was constructed by following these steps:

The purpose of the test: the desire of constructing the test was to measure students’ vocabulary aptitude in the English language by depending on the behavioral objectives specified by the teachers’ guide.

Determining test items: the test items were determined by the researcher to be 25 test items and prepared a scoring scheme for the test.

The test was designed by depending on the revised Bloom’s Taxonomy of educational objectives. The first question depends on level three and four of the taxonomy (applying/analyzing), it expects pupils to analyze the statements into parts of speech and after that distinguishing the parts of speech that these words belong to. we particularly request one of each of the following (Noun, Verb, Adjective, Adverb, Auxiliary). The second question depends on the second level of the taxonomy (comprehension/understanding) in which we request that learners state in a single word the meaning that fits the definition that we are giving, it tests their understanding of the meaning of words and relating them to what they have studied. The third question depends on the first and second level (remembering and understanding) we ask them to recall the meaning of the given words and after that understanding which fit the context of the given sentences. We choose these levels because they fit best with the students’ level in the English language. The questions’ design principles follow the instructions of the teachers’ guide and the works of McCarthy and O’Dell (1994). The material used in the pretest questions were taken from unit 5.

Test scoring: the scoring of the test is done by giving one mark to each right answer in the first question and a zero to each wrong answer and giving two marks for each right answer in the following questions and a zero for the wrong answer. The highest score was set to be (40) and lowest to be (0).

Test validity: the test was validated by jury members of language teaching specialists which gave some recommendations and amendments that the researcher took into his consideration and altered his test accordingly. The test was also validated by testing it on a pilot study.

Pilot study testing

The researcher chose the students of two schools that are located near the main school on which the experiment was conducted. The two schools were Karbala preparatory school and Otmsn Bin Saed on (50) student from each school. The test items were statistically analyzed and found that the item difficulty ranged from (0.76-0.31) by which the test items are considered valid in difficulty. The item discrimination ranged from (0.82- 0.33) which is accepted also.

Conducting the test

The students of both groups were notified a week ahead of the exam. And the researcher supervised both of the exams personally at the same time.

The Satisfaction Survey

The satisfaction survey is defined as the method by which the researcher gathers and identifies the
satisfaction levels of customers or users of a specific product to offer chances of improvement in the future (Business Dictionary, 2017:127). There are various means of gathering input in a specific device (i.e. phone calls, online chats. Interview, or questionnaires) for the present study used the latter method in which the researcher designed a ten questions satisfaction questionnaire based on a Likert scale. The questions were answered by the experimental group students on the second of June after the experiment was concluded. The objective of the questionnaire was to collect data that provides feedback on students' attitudes and psychological reactions toward the implementation of the Clickers devices in their customary teaching so that the researcher can base valid judgments on how the utilization of the device was received by the students.

### Table 1. The mean results of both groups

<table>
<thead>
<tr>
<th></th>
<th>group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
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<tbody>
<tr>
<td>pretest</td>
<td>control</td>
<td>39</td>
<td>14.10</td>
<td>5.044</td>
<td>.713</td>
</tr>
<tr>
<td></td>
<td>experimental</td>
<td>37</td>
<td>14.04</td>
<td>6.401</td>
<td>.905</td>
</tr>
<tr>
<td>posttest</td>
<td>control</td>
<td>39</td>
<td>14.32</td>
<td>6.507</td>
<td>.920</td>
</tr>
<tr>
<td></td>
<td>experimental</td>
<td>37</td>
<td>19.98</td>
<td>8.952</td>
<td>1.266</td>
</tr>
</tbody>
</table>

**RESULTS AND DISCUSSION**

The students of the experimental group who studied according to the Clickers technology were superior to the students of the control group, who studied according to the traditional method in the achievement test, thus rejecting the first null hypothesis and accepting the alternative null hypothesis: (There is a statistically significant difference at the level of (0.5) And the average score of students in the control group who study according to the traditional method in the English test). The psychological state of the students where positive in four major categories (1) the concentration levels have increased tremendously. (2) The students’ participation levels enhanced significantly. (3) The enjoyment levels also increased greatly. (4) Psychologically the levels of fear have dropped massively due to the anonymity.

**CONCLUSION**

The study also concluded that the utilization of the Clickers technology has had a positive psychological effect on the learning experience of the students and that they would like for the implementation of the device to continue. Future studies could very well expand and support the findings of this study or yield different results.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Higher Studies Department, University of Babylon, College of Basic Education. Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Stable Activities, Developing the Community Concerning the Product and Psychological well-being of the 2nd Intermediate Class Achievement in Geography

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ABSTRACT

The study aims at revealing the effect of the stable strategic activities in the 2nd intermediate-class-achievement in Geography. The research-data consists of the intermediate schools at Babylon Government/ Al-Mehaweel District. Particularly, At Tesamy Intermediate School has been chosen as the research-data. Two groups have been included in the study: the experimental group and the adjusted one. The first group has been taught according to the traditional method whereas the second group has been taught using the strategic activities. The researcher takes into consideration the variables found like the pupils’ age and their previous marks. Statistical tools have been utilized like Chi-square and other ones shown in the analysis of the study. The results of the study show that the experimental group has exceeded the other group in the idea of achievement. Thus, the differences found are said to be significant at(0.05) degree of freedom.

Keywords: Stable Strategic Activities, Achievement and the subject of Geography.

INTRODUCTION

Education is responsible about developing the community concerning the product. Mental health is a level of psychological well-being or an absence of mental illness. It is the “psychological state of someone who is functioning at a satisfactory level of emotional and behavioural adjustment. From the perspective of positive psychology or holism, mental health may include an individual’s ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience. It, also, encourages the pupils to join the educational programs weather the vocational or the technical ones. Actually, this requires that the educational institutions should not concentrate only on the theoretical areas but, also, on the practical ones.

It should promote the pupils to do participate in the activities which go with their tendencies. In turn, this step would be beneficial to their society. This idea can be done through letting the pupils participating in the activities, advising them and giving them lessons. The social-entities are in deep connection with the real life with its different phenomena. Such social-entities pave the way for various fields which leads to the intended social development. Then, The pupils would be developed well. Geography is a science which studies the natural phenomena and the relation of man with the environment. Such things are the basics for education as they facilitate the pupils to solve their problems through developing the spatial dimension for the teachers and clarifying the relations found between the human and the natural entities and searching for some rules to systemize the human to get benefit out of the environment. It is to be mentioned the environment should be taken into consideration. Thus, the researcher thinks that Geography is the only that can picture the earth clearly. It explains the natural phenomena, their reasons and their consequences. It also declares the effect of the environment to its living entities. The educational activities have their impacts in the formation

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of the learners’ experiences developing their attitudes. So, such activities are considered as the cornerstone in the building of the curriculum when they are linked to the objectives of the curriculum. The researcher considers the importance of activities' distribution as the latter would make the atmosphere of learning more interesting, developing the pupils’ personalities and avoiding shyness. Achievement is remarkable as it reveals some different behavioural of the learners as when found in thinking, knowledge, skills and intellectual tendencies. The researcher thinks that the academic achievement is important as it affects the pupil and his/ her family. It is not a matter of getting high marks but of its consequences later on. Furthermore, it has an implication about the others’ opinions as they would be affected by the pupils’ academic achievement. In addition, the pupils would be feel comfort when getting such achievement. It is significant to explain important terms: define this term as a kind of the educational and the learning activities being designed by the teacher for certain objectives. Each activity has its one goals. When put, such activities have to be varied in type and level as to go with the pupils’ different needs. Moreover, these activities must be linked with the learners’ positivity when put in real life situations. The problem of the pupils’ academic achievement is crucial. It leaves its own impacts on the pupils’ environments. It needs to be considered as to solve it. Traditionally, at our schools, the pupils have been enforced to stay in their positions when being taught. They have been treated as if being sponges that get the water in. Nowadays, the concentration is on the educational- activities- use in the curriculum- design. It is seen that such activities are as fruitful as their consequences would be valuable. Thus, they are being highlighted. Al- Joobory Study (2017): the study aims at showing the effect of the strategic activities in the achievement of the 2nd intermediate class in the subject of Geography. The study takes place in Babylon University/ College of Basic Education. The pupils’ number of the study is sixty nine female ones. The following procedures are applied: Chi- square, Coefficient difficulty. The results declare that the experimental group exceeds the traditional one in the idea of the academic achievement. Al- Obaydy- Study (2017): the study aims to show the effect of employing the academic activities according to the sustainable development at the 4th scientific class in Biology. The study takes place at Baghdad University/ College of Education for Pure Science/ Ibn Al- Haythem. Seventy two female pupils is the study- data. The experimental curriculum is followed in the study.

**METODOLOGY**

**The Procedures:** they include: the used curriculum, the pupils, the equivalence between the experimental and the traditional groups, setting the internal variables, the research- requirements and the statistical tools used to show the effect of the strategic activities in the achievement of the 2nd intermediate class in the subject of Geography.

**The Experimental Design:** it is distinct for two reasons. First, it is the only type that effects on a specific variable directly. Second, it can, also, test the hypotheses under the term of the result- cause- relation Table 1.

**The Research- data:** the data of the research is the 2nd intermediate class in the governmental schools. These schools are for boys and for the morning- study. Geographically speaking, they are at Al- Mehayweel District in Babylon Government. Intentionally, Al- Tessamy intermediate schools has been chosen by the researcher out of fourteen schools. Moreover, the researcher visits the school officially. The 2nd intermediate class of that school consists of three sections: A, B and G. Randomly, section G which consists of thirty four pupils has been chosen for the study. This class would be taught according to the strategic activities. Again, in the same process, section B which consists of thirty six pupils has been chosen to be taught according to the traditional method of teaching. In all, the number of the pupils reaches seventy ones. Yet, five pupils have been excluded as they have failed previously at the same year. So, they have been taught the material before. At the time of doing the teaching- steps, those excluded pupils have been kept in the class to avoid the noise as seen in Table (2).

**The Study- groups- Equivalence:** the researcher takes into consideration, in advance, the equivalence of the two groups of the study concerning the variables. Such variable include: the pupils’ age, the pupils’ first term marks, their parents’ educational- level, intelligence – level (Raven).

**Setting the Internal Variables:** in addition to the idea of the equivalence in the study, the researcher tries to set some of the internal variables). This is so as to ensure the validity of the study. Such variables include: the date, measurement- tools, maturity- related- process
and the experimental attrition. The material to be taught for the pupils has been set by the researcher. It includes the third chapter entitled as ‘The Industry’, the fourth chapter entitled as ‘The Inhabitance’ and the second section entitled as ‘The New World Continents’. These topics are found in the subject of Geography of the Arab World 35th ed. This material is related the second term of the 2nd intermediate class 2017- 2018 A.

RESULTS AND DISCUSSION

Depending on the material- content which would taught through the experiment, the researcher sets (120) behavioural- objectives. The material- content is divided into the three levels of Liblum. These levels include: knowledge, understanding and application. In order to ensure objectives- validity, they have been viewed by some specialists in that field. The mentioned objectives are divided into (57) ones of knowledge- level, (38) ones of understanding- level and (21) of the application- level. It is to be mentioned that the objectives have been depended on at the percentage of (80%). This can be seen in table (7) more clearly. Setting the Teaching- plan: a group of teaching- plans have been prepared by the researcher for the two groups (the experimental and the adjusted). These plans, certainly, accord with the date of the study and the aims put. The researcher, also, has benefited from experts of that field. Thus, the researcher prepares an achievemental- test as testing is considered a measuring- tool. Such test is applied to the 2nd intermediate class at the subject of Geography. The test- items are fifty ones. Forty items are objective and ten items are essay one Table 2, 3. Instructions of the Test- correction: the test- marking is set. A mark is given for the correct objective item and zero for the wrong or the left ones. Concerning the subjective item, two marks are given for the correct essay items, a mark for the incomplete items and zero for the wrong or the left items. The total degree is out of sixty. The correct distribution according to the three levels of the knowledge of the first three, and the paragraph was considered valid if it obtained the proportion of agreement (80%) and more of the total arbitrators and specialists, the test was initially applied to two samples in order to ensure that the test instructions and statistical analysis of its paragraph were clear as follows: The Test- truthfulness: if the achievemental- test measures the put educational aims, it is considered true. Thus, it is considered basic in testing- setting. The researcher takes the experts’ opinions as to accord with the three levels of knowledge: The First Explorated Data: it is a data used for clarifying instructions and items, knowing to what extent the items are clear, diagnosing the ambiguous items and the time required to answer the questions. The Second Explorated Data ‘The Data of the Statistical Analysis’: the aims of analysing the test- items is to improve the test. This can be done through discovering the weak points to rephrase them or delete the unnecessary ones and ensuring that the test- points suit the individual differences of the pupils. Actually, the pupils would differ according to the easiness or the difficulty of the points. To know the difficulty of the test- points, the researcher applies the test on Wednesday (18/ 4/ 2017 A. D.) at Al-Qimam Intermediate School for Boys. This test has been applied on another data. The data consists of one hundred pupils. The marks of the pupils have been in a descending way. The percentage of pupils who have got high marks is (27%) and it is the same percentage of the pupils who have got low marks. The, the number of the pupils is (54) being branched into two groups as the percentages show that. The procedures of that test would be explained. The difficulty coefficient of the paragraph was used using the difficulty factor. The difficulty coefficient for the test paragraphs ranged from 0.39 to 0.69. The difficulty coefficients for the mounting paragraphs ranged from 0.29 to 0.61 that is why all test paragraphs are accepted. The distinct strength for each item equals (0.56 0.33) whereas it is (0.41 0.31) of the essay- points. In the analysis- steps, it’s found that all the points put are valid according to their distinct strength. The pupils’ answers have been organized according to the test- points. They, also, been divided into two groups: high and low. The insignificant alternatives are found to be between (0.26 - 0.3). This indicates that the pupils of the low group have been tempted by the insignificant alternative more than the pupils of the high group. The zero hypothesis entails that there is no difference at (0.05) between the marks of the two groups: the experimental group and the adjusted group. To test this hypothesis, the researcher applies (T-Test) and (calculative average) through using T-test for two independent data to compare the marks of the two groups as seen in table 5. This result indicates the idea that the pupils of the experimental group who have studied according to academic stable strategic activities exceed the pupils in the other group. So, the first zero hypothesis and the alternative zero hypothesis is verified (there are significant differences at (0.05) degree of freedom between the adjusted group and the experimental group at the 2nd intermediate class. This
is so as the latter group has been taught using the activities whereas the other group does not). There are, also, significant differences between the marks of the two groups. Thus, the marks of experimental-group pupils have exceeded those of the other groups.

Table 1. The Experimental Design of the Research

<table>
<thead>
<tr>
<th>The Group</th>
<th>The Independent Variable</th>
<th>The Dependent Variable</th>
<th>Research-tool</th>
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<tbody>
<tr>
<td>The Experimental Group</td>
<td>Stable Strategic Activities</td>
<td>Achievement</td>
<td>Achieve mental-test</td>
</tr>
<tr>
<td>The Adjusted Group</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Table 2. The Data of the Study with the Two Group before and after the Excluding

<table>
<thead>
<tr>
<th>The Group</th>
<th>The Section</th>
<th>The Pupils’ Number before Excluding</th>
<th>The Unsuccessful Pupils’ Number</th>
<th>The Pupils’ Number after Excluding</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Experimental Group</td>
<td>G</td>
<td>34</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>The Adjusted Group</td>
<td>B</td>
<td>36</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>70</td>
<td>5</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 3. The Behavioural- objectives according to the Three Knowledged Levels

<table>
<thead>
<tr>
<th>Classes</th>
<th>Levels of the Behavioural- objectives</th>
<th>Total%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge 47%</td>
<td>Understanding 32%</td>
</tr>
<tr>
<td>3rd Class</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>4th Class</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>2nd Section</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>38</td>
</tr>
</tbody>
</table>

Table 4. The Descriptions- table (The Experimental Map)

<table>
<thead>
<tr>
<th>No</th>
<th>The Sections</th>
<th>The Pages-numbers</th>
<th>The Relative Importance</th>
<th>Levels of the Behavioural- objectives</th>
<th>Questions-average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Knowledge 47%</td>
<td>Understanding 32%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3rd</td>
<td>16</td>
<td>40%</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>4th</td>
<td>10</td>
<td>25%</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2nd</td>
<td>14</td>
<td>35%</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>24</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 5. The Results of T-test of the Two Groups of the Study in Geography

<table>
<thead>
<tr>
<th>The Group</th>
<th>Pupils-number</th>
<th>Calculative average</th>
<th>The Normative-deviation</th>
<th>The Variance</th>
<th>The Degree of Freedom</th>
<th>T-test The Calculated One</th>
<th>The Tabular One</th>
<th>The Statistical Indication at(0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Experimental Group</td>
<td>32</td>
<td>43.25</td>
<td>7.44</td>
<td>57.35</td>
<td>63</td>
<td>3.007</td>
<td>2.000</td>
<td>Significant</td>
</tr>
<tr>
<td>The Adjusted Group</td>
<td>33</td>
<td>37.39</td>
<td>8.22</td>
<td>67.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSION

So far, it is concluded that the stable strategic activities are fruitful as the pupils’ level is affected a lot. The 2nd intermediate pupils of the experimental group have exceeded the adjusted group through the achievemental- tests. Such a new way of learning would participate in upping the pupils’ levels. The researcher, also, thinks that the pupils could be kept active through discussion and answering the points raised through the lessons.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Methods of Teaching Geography Department, College of Basic Education/ University of Babylon/ Babylon Government, Iraq. Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


The Effect of the Active Thinking Model on the Achievement of the First Grade Students in Science

Hussein Abbas Mughir, Mohammed Hamid Al-Masoudi, Reham Abbas Khudair
1 College of Basic Education, University of Babylon, Babylon Government, Hillah City, Iraq

ABSTRACT

The current research aimed at identify effect of effect of Active Thinking Model strategy in obtaining Science material for First grade students and verifying the hypothesis validity, the researcher chose the experimental design (of partial control) and the research sample was chosen deliberately from the research population represented by Babil governorate students for the academic year (2017-2018) and for application of the experiment, the sample included (60) students distributed on two groups equally and the researcher statistically equals in the following changes: (age in months, Raven intelligence test, marks for the previous academic year) and outcome test was set included (40) objective Items of multiple test type, the researcher suitable used Sps, the research showed superiority of the experimental group who studied according to the outcome test.

Keywords: Active Thinking Model, Achievement, First Grade Students, Science

INTRODUCTION

Brain is the physical machine of thinking and the ability to generate human ability to perception and expression as well as understanding the meanings and respond to instructions. The human being is only a notebook, and hence the discovery of the scale of electrical brain to a certain understanding of how the brain works, and that neurons are the basis of learning and memory. The brain is a member of learning and thinking. Therefore, the brain is the floor of desire, the place of learning, memory, and knowledge of objects, people, images and colors. It is the center of consciousness of the body. It is the voice to the human self and its environment. It describes that distinguishes, compares, reflects and dreams. Each experience and new experience passes by the individual really changes from the chemical composition of the brain to the brain, and that the receiving of the brain is exciting of any kind. The process of communication between the neurons is activated. Thinking is an important mental process. It is the foundation of the progress of societies. It is a series of mental activities that the brain performs when it encounters one or more stimuli received by the five senses. The researchers that count thought activity to solve the problem and another mental treatment of sensory input or interaction between the mind of the learner and information towards a particular goal, and thinking a series of mental activities performed by the brain when faced with an exciting being received by one or more of the senses. Active thinking is an educational model based on the Vickotsky and Sternberg tripartite theories, consisting of eight steps (gathering information, identifying and discriminating, generating ideas, decision making, implementation, calendaring, communication, learning from experience), helping students to think effectively in an atmosphere of atmosphere of social interaction.

METHODOLOGY

It includes a presentation of the procedures that have been carried out to achieve the research objectives, starting from the research methodology and experimental design, defining the research community and its design, the equivalence of the research groups (experimental...
and control), preparation of the research requirements and tools.

The Pilot design for research

It includes one independent variable (the active thinking model), the usual method, and the dependent variable. Therefore, the researchers used experimental design with partial adjustment of two equal groups, one experimental and the other control.

Search community and design

The current research community represents the students of the first grade intermediate in the intermediate day schools of the General Directorate of Education in the province of Babylon for the academic year (2017 - 2018), while the same research has chosen the researcher (School Masoudi) in the Alexandria area in the province of Babylon deliberately to conduct research. After selecting the researcher (Masoudi school) to apply the experiment, as it consists of three people for the first grade intermediate (A, B, C), was selected (B) random sampling method to represent the experimental group and the number of students (36) student students will study according to (Active thinking model), Division (c) control group and number Its students are 38 students who will study their students according to the usual method.

RESULTS AND DISCUSSION

Age time calculated in months: according to students age mean , age mean of the experimental group (170.27) mark/month while mean of the control group (170.60) mark using t -test for two independent samples to know the difference significance between the two groups, it has appeared that there is no difference of statistical significance at (0.05) significance level, where calculated t value(0.788) smaller than tabular t value(2) and freedom degree (58) and this indicated that the research two groups are equivalent in the variable and the following table illustrated.

<table>
<thead>
<tr>
<th>Students marks in Science subject for the previous academic year:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students marks from the mark record and after obtain the marks</td>
<td></td>
</tr>
<tr>
<td>the mean and standard deviation were extracted, where mean of the experimental group(62.60) with standard deviation(13.18) while mean for the control group(62.76) with standard deviation(12.99) and to know the difference the equivalent was performed using (t-test) for two independent samples, it has appeared no different of statistical significance between the two groups, where tabular t value(2.000) greater than (0.835) at significance level(0.05) with freedom(58).</td>
<td></td>
</tr>
</tbody>
</table>

Adjusting extraneous variables

In spite of the achievement of the equivalence of the two groups of research in some variables that are believed to affect the course of the experiment, in order to avoid the effect of some extraneous variables in the course of the experiment and some of these variables: (Accidents associated with the experiment: Experiment in the search did not experience any emergency or accident hinders Experimental Expiration: No case of interruption or transfer of any students throughout the experiment. Sample selection: The two research groups were chosen in the right way and the two groups were confirmed. The maturity factor: The duration of the experiment was uniform between the two research groups. So what happens N growth will return to the members of the two groups at the same level, so it was not for this factor in the impact of the research, the impact of the experimental procedures: The researchers work on reducing the impact of the experimental procedures that could affect the dependent variable during the course of the experiment).

The pilot application for the test of achievement

The first test was carried out on a group of first grade students from the non-research sample. The number of students was 30 students. The purpose of this test was to know the clarity of the test instructions and instructions, the comprehension of the test paragraphs for the students and the calculation of the time required for the test. The researchers recorded the exit time for all students. In calculating the arithmetic mean of time, it was found that the time needed to answer all the test paragraphs was (43) minutes.

The second test application: The test was applied to a sample of 100 students in the first grade of the average non-research sample. The purpose of the test is to analyze the statistical achievement test paragraphs, namely paragraph difficulty, paragraph discrimination, effectiveness of the wrong alternatives.

Statistical analysis of the test scores

The difficulty of the paragraph: The statistical analysis of the test test paragraphs found that the
coefficient of difficulty of the paragraphs ranged from (0.35 - 0.70) and thus all the test scores are good and difficult.

The distinction of the paragraph

The important characteristics that must be provided in the paragraphs of the test is the characteristic of discrimination and means the possibility of items or paragraphs to identify individual differences of students and the test items are valid as the coefficient of discrimination of items is (20,0) and above, (0.32 - 0.65), so the test scores are well marked and appropriate.

Effectiveness of the wrong alternatives: The researchers conducted a statistical analysis (27% and 27%) to find the effectiveness of the wrong alternatives ranging from -0.11 to -0.3.

The stability of the test: The coefficient of the stability of the test depends on the relationship between each paragraph or between the paragraphs of the test all, and this is evidenced by the stability of degrees and consistency of paragraphs, and can calculate the stability of the test using the legal relationship between the units of the test, and the characteristics of the good test to be stable and true and even be The test paragraphs have a clear meaning that must be both true and consistent. Stability indicates that the test scores match once again, ie, it indicates the balance and stability of students’ grades in the test.

Methods of finding the stability of the test:

The method of fragmentation: This method is one of the most widely used methods, because it avoids the disadvantages of some other methods. In order to obtain two equal images of the test, the researchers divided the test paragraphs into individual and marital paragraphs and chose the answers of the sample of the survey sample (100) Pearson correlation between individual and marital scores was obtained by the coefficient of stability (0.77). Since the half-stability coefficient of the test did not measure the total homogeneity of the test (because it is only half stability), the correction was done using the Spearman-Brown coefficient, Lg (0.87) is a good stability coefficient from the point of specialist’s view.

Koder-Richardson Method 20: The Koder-Richardson equation was applied according to student scores. The researcher found that the test stability value is (0.82) and it is a good value and suitable to keep test is stable.

Application of the research tool: The experimental and control groups were informed of the date of application of the test, one week before it was carried out, and it was applied after the completion of teaching the specific material for the two research groups at one time. The researchers supervised the application of the test.

Statistical methods: The researchers used the T-test equation for two independent samples, and the ki-square, to make the parity between the experimental and control groups in the following variables: (the age of time calculated in months, the achievement of students in half the year in science, the intelligence test).

Statistical instrument: T-test for two separate groups and Coefficient of ease and difficulty for distinction item, wrong alternative activity and Kai square (Chis – quire – x2). In order to verify (zero hypothesis) which stated that (there is no difference with statistical significance at significance level (0,05) between average degree of students achievement of experiment group who study Science lesson according to Active Thinking Model and average degree of students achievement of control group who taught the same subject in traditional method in test of achievement). Average degree of both groups were calculated which showed that average degree of students achievement of experiment group was (30,16) degree with standard deviation of (4,12) whereas average degree of students achievement of control group was (25,46) degree with standard deviation of (2,52). In order to identify statistical difference significance between average degree of both groups, the researcher used (T-test) for two independent samples as statistical instrument to display the results Table 4. Table (4) showed existence of Statistical significance between average degree of achievement test for both experimental and control groups. Superiority was for favor of control group students, as calculated (t-test) was (3,66) which was the bigger than tabular t-test (2,00) at significance level (0,05) with free degree of (58) which indicated that Active Thinking Model has positive effect upon students achievement in subject of Science. accordingly this result refused first zero hypothesis.

Explanation of the results

Using Active Thinking Model has helped the students
to gain required knowledge and participated in class room, creating positive directions towards the subject, respect views, interaction and active participation reduces shy element and encourage the students to more participation and express new ideas. Active Thinking Model has helped in organizing study item, reformation, gathering and crystalized in new image that facilitate the subject to the student to understand. Using Active Thinking Model has stimulated psychological motives of experiment group student to be alert and think and work hard to achieve success.

Table 1. Mean, difference, calculated and tabular t value for the two groups of the research in intelligence variable.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of the sample</th>
<th>mean</th>
<th>difference</th>
<th>T value</th>
<th>Freedom degree</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>30</td>
<td>45.50</td>
<td>32.26</td>
<td>0.34</td>
<td>2.00</td>
<td>58</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>45.90</td>
<td>8.85</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Mean, standard deviation, difference, calculated and tabular of t for the experimental and control groups in age time calculated in months.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of the sample</th>
<th>Mean</th>
<th>S.D</th>
<th>Difference</th>
<th>Freedom degree</th>
<th>T value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>30</td>
<td>170.27</td>
<td>11.64</td>
<td>135.58</td>
<td>58</td>
<td>0.788</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>170.60</td>
<td>13.29</td>
<td>176.66</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. For mean and standard deviation and calculated and tabular T- value in variable of previous general degree for Science subject

<table>
<thead>
<tr>
<th>Total</th>
<th>Size of the sample</th>
<th>Mean</th>
<th>standard deviation</th>
<th>Degree of freedom</th>
<th>T- value</th>
<th>Level of significance (0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>30</td>
<td>62.60</td>
<td>13.18</td>
<td>58</td>
<td>0.835</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>62.76</td>
<td>12.19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. The mean and standard deviation and calculated and tabular T- value of degree of both groups (experiment and control) in achievement test.

<table>
<thead>
<tr>
<th>Total</th>
<th>Size of the sample</th>
<th>Mean</th>
<th>standard deviation</th>
<th>Degree of freedom</th>
<th>T- value</th>
<th>Level of significance (0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>30</td>
<td>30.16</td>
<td>4.12</td>
<td>58</td>
<td>3.66</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>25.46</td>
<td>2.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION

Using Active Thinking Model with in the limitation of the research has proved its effectiveness in raising achievement level. Also growing logical thinking of the, First class students in Science subject. Teaching according to Active Thinking Model displayed positive effectiveness by creating interaction sphere between the teacher and the students in Science history subject, and giving opportunity to the participation in encouraging activities for more thinking about discussed information in the class room. Teaching according to Active Thinking Model will develop logical thinking with the student by provide opportunity for free express of opinion with positive results .Also one minute strategy allow the student to response to the intellectual questions actively.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon Government, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES

Mothers’ Attitudes toward Childhood Cancer in Oncology Unit in Pediatric Teaching Hospitals at Baghdad City

Khamees Bandar Obaid
College of Nursing, University of Baghdad, Dean College of Nursing, Warith al-Anbiya University, Iraq

ABSTRACT

The purposes of the study to assess mothers’ attitudes about childhood cancer and is there relationship between mothers’ attitudes with demographic characteristics for mothers, child and child’s illness. A descriptive study was conducted at Children Welfare Teaching Hospital and Central Child Teaching Hospital in Baghdad City from the period of November 1st 2016 to April 1st 2017. A non-probability (purposive) samples of (100) mothers whom have cancer children under chemotherapy. Data were collected by an application of direct interview. The data were analyzed through the application of descriptive statistic frequency, percentage, and the application of inferential statistical procedures, which include correlation coefficient. The results of the study indicated that more than half of participants have negative attitude toward childhood cancer and under chemotherapy (52%) and there is significant association between education level with and mothers’ attitude (p-value = 0.05). The study indicated that the most of mothers whom have child with cancer and receiving chemotherapy have negative attitude toward childhood. However, the findings of the study indicated that mothers’ education direct impact on mothers’ attitude.

Keywords: Mothers’ attitude, childhood cancer, Oncology Unit.

INTRODUCTION

During the last 36 years Iraq had many wars, crises and abnormal situation. Iraq had seen three wars, (Iran-Iraq war), (Gulf War), and (Iraq-USA War) . There are many an abnormal situations and crises as well as economic sanctions (1990-2003), and American occupation (2003-2010). This wars and crises have a negative impact on the people’s health and they lead to increased incidence of morbidity and mortality rate of childhood cancer. Cancer is terms refer to abnormal cells divide without control and are able to invade to other tissues \(1,2\). Childhood cancer is still a life-threatening illness. Childhood cancer incidence is increasing worldwide \(2,3\). It is consider as the third leading cause of death among children age between 1 to 4 years, and the second leading cause of death among children age between 5 to 14 years \(4,5\). In the United States of America cancer is the second leading cause of death in children ages 5-14 years old in the \(1\). Common malignancies in pediatric are include leukemia (30%), brain tumors (20%) and lymphoma (12%), and followed by neuroblastoma and retinoblastoma \(6,7\). The most common tumors in Iraq are breast cancer (14%), lung cancer (10.6%) and bladder cancer (7.5%) \(8,9\).

A diagnosis of childhood cancer produced many challenges for children and their parent. The parents of children have to play an expanded role because they need to reconcile parental tasks and treatment demands. Management of childhood cancer will cause so many side effects to the children and have many burdens on child and their family \(10\). Mothers of children with cancer and undergoing chemotherapy treatment experience psychological distress and disorientation \(11,12\). Cancer consider as a source of preoccupation, questions and doubts. Misconceptions about cancer make parent confused or unsure when choosing a treatment \(3\). Attitude refers to any reaction to social demands; it is expected to create preparation and guidance to the manifest behavior of the individual. It is positively or negatively responds towards a certain idea, object, person, or situation. Attitudes play an important role in understanding disease and in intervention. Attitude influences an individual’s choices of action, and responses to challenges, incentives and rewards. Attitude has three major components: cognitive, emotional, and behavioral, each contributing to the formation of the attitude \(14,15\). One significant challenge in the care of childhood cancer involves the
mother’s attitude regard to childhood cancer treatment. Increases positive attitude about childhood cancer and it treatment is necessary to help parents anticipate and understand disease prognosis and decrease the impact of cancer on their children. A positive attitude can motivate cancer child and their family to take better care of them and improve the quality of your life during cancer treatment and beyond 14. Attitude refers to any reaction to social demands; it is expected to create preparation and guidance to the manifest behavior of the individual. It is positively or negatively responds towards a certain idea, object, person, or situation. Attitudes play an important role in understanding disease and in intervention. Attitudes influence an individual’s choices of action, and responses to challenges, incentives and rewards. Attitude has three major components: cognitive, emotional, and behavioral, each contributing to the formation of the attitude 16,17.

MATERIALS AND METHOD

A descriptive study was conducted at Children Welfare Teaching Hospital and Central Child Teaching Hospital in Baghdad City from the period of November 1st 2016 to April 1st 2017. A non-probability (purposive) samples of (100) mothers whom have cancer children under chemotherapy. Data were collected by an application of direct interview. The data were analyzed through the application of descriptive statistic frequency, percentage, and the application of inferential statistical procedures, which include correlation coefficient.

RESULTS AND DISCUSSION

Cancer has many burdens that effect on children and their family. The mother who have child with cancer need to increase their knowledge, develop their practice and modify their attitude. In Iraq there is no clear teaching program for parents about childhood cancer. Data represented the total mothers’ attitude toward childhood cancer. It classified to positive and negative attitude. The study indicates that more than the half of the study participants has negative attitudes toward childhood cancer (52.0%) Table 1. Data of selected risk factors that were found to be significant in t test and significant at (P-value = 0.05). According to the final results there is only significant association between mothers’ education level with attitude (p-value = 0.05). There was no significance with Mother’s age, type of family, residence, duration of illness and mother’s occupation (Table 2) 14, this study concluded that more two third of mothers has negative attitude towards care of children with cancer. Other study support finding of this study was done by Jiang et al; 2007 13, that reported that preferences of childhood cancer treatment influence by positive attitude. Another study disagreed with the results of this study are the study done by Young et al; 2010 20, he concluded that family caregivers have a positive attitude toward patients with cancer. Rachel et al; 2013 21, reported that one of the important factors are at play in influencing on childhood cancer treatment decisions and disparities is parent knowledge, attitudes, about treatment and healthcare experiences. The results of this study is contrast with study done by Sharpe, 2005 17, he concluded that parent awareness about childhood cancer and details of treatment can help parent to provide good caring, appropriate interventions and good follow up. Parents differ in how much information they need or feel they can handle about the disease. Jansen et al;2001 19, reported that when patient have more positive belief and attitude towards cancer treatment was a more important determinant of patients’ preferences than positive experience of the treatment. According to results of our study there is only association between mothers’ education level with attitude ( table 2), this result agree with study done by Jeff and Andrea, 2007 22, they concluded that cancer is strongly and negatively associated with education parent negative beliefs about cancer prevention were stronger among respondents with lower levels of education. Finally the childhood cancer is still big dilemma to the children and their family and one of most common factors effect on quality of parent life during cancer treatment and choosing treatment is influence by the parental belief and attitude. Positive attitude of mothers encourage them to more coping behaviors and more adjustment with disease.

Table 1. Total mothers’ attitude toward childhood cancer. It classified to positive and negative attitude.

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Frequency</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive attitude</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Negative attitude</td>
<td>52</td>
<td>52</td>
</tr>
</tbody>
</table>
Table 2. T test analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Mother’s age</td>
<td>.625</td>
<td>.757</td>
</tr>
<tr>
<td>Educational qualification</td>
<td>.270</td>
<td>.164</td>
</tr>
<tr>
<td>Type of family</td>
<td>.906</td>
<td>.715</td>
</tr>
<tr>
<td>Mother’s occupation</td>
<td>-.529</td>
<td>.539</td>
</tr>
<tr>
<td>Duration of illness</td>
<td>-.628</td>
<td>.274</td>
</tr>
<tr>
<td>Residence</td>
<td>.564</td>
<td>.414</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The study indicated that the most of mothers whom have child with cancer and receiving chemotherapy have negative attitude toward childhood. However, the findings of the study indicated that mothers’ education direct impact on mothers’ attitude.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing, Warith al-Anbiya University of Karbalaa, Iraq and all experiments were carried out in accordance with approved guidelines.

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Evaluation of Professional Courses according to Some National Academic Accreditation Standards and Diagnosis the Effects on Students in the Psychological and Mental Aspects

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ABSTRACT

The current research aims to evaluate the professional courses in the Department of Geography according to some of the national academic accreditation standards. The research community includes the professional courses for the fourth stage; the researcher took the research society (teachers of educational, psychological and geographic sciences) and (fourth stage students) at Mustansiriyah University and Babylon University for a sample of his study. It was based on some national standards in Iraq: - Calendar - International cooperation in the evaluation of the academic program) and was the focus of the objectives and the axis of evaluation and the axis of international cooperation in the evaluation of the academic program within the evaluation of teachers and the focus of content curriculum and the strategies of teaching and learning within the evaluation of students has developed five alternatives to it is (OK - OK OK somewhat -gar OK -gar perfectly OK) and after unloading results showing superiority of some indicators on other indicators.

Keywords: Calendar - Courses - Department of Geography - Standards - Academic Accreditation

INTRODUCTION

The evaluation is one of the elements of the basic curriculum, so educational studies have shown the need to reconsider the development of the curriculum and its effects on the mental and emotional aspects of the students, which requires re-formed or modified and balanced curricula and systems have proven their progress and success¹. Will help in the development of the performance of educational programs, which is reflected on the performance of students, whether on the mental or emotional side, and note that the calendar has an impact in the curriculum, so it leads to the diagnosis of weaknesses and the effects on students in the psychological and mental aspects, Strength, which enhances the cognitive side of them and ultimately reflected on the mentality of the student and his psychological emotions. Education is a social and humanitarian process that aims at caring for the individual and the society by fulfilling his wishes and hopes and fulfilling his needs. As education is a social necessity and enjoys a value and importance because it has a practical effect in all societies and educational institutions, to prepare the individual physically, mentally, psychologically and socially. His personality in its various dimensions, so that he can live happily with others. Through, his contributions, interactions and activities in cooperation with his community and environment, modern education is the process of individual numbers and the development of his perceptions, abilities and personality. Thus, the researcher sees the responsibility of education in the numbers of individuals for life and according to their specialities to contribute later in building and developing society through providing suitable opportunities for them. The faculties of the university and its institutes and institutions stand the faculties of education and basic education or should stand in a particular location also, which is responsible for the most critical and dangerous sector of development, human development and the process of assessment reflects the meaning of reform and amendment. Interpretation and appreciation are essential and vital because they provide teachers, administrators, curriculum designers and developers with valuable

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information on the effectiveness of these curricula, what modules are most appropriate and what remedial programs are to be used in the future. To identify the weaknesses of the avoidance and strengths to support them, and the importance of research in the evaluation of the decisions of the From the disclosure of the strengths and weaknesses in the decisions of the faculties of basic education, and the objective of the current research to the proposed vision to develop the means of evaluating the professional courses in geography according to some of the standards of academic accreditation in the Iraqi national universities, the researcher saw the importance of the current research that the evaluation is an essential element and natural entrance to ensure quality. And to improve them continuously in the field of higher education. The professors of educational and psychological sciences were selected for the fourth year of the academic year 2017-2018 at Mustansiriya University and the University of Babylon. Weakness geographical divisions in the faculties of basic education, which did not undertake a previous evaluation, and to assist all parties to the educational process of students and teachers and educational competence N and implementers of the curriculum 2-4. The progress achieved in the educational studies showed a need to reconsider the content of the curricula, which requires re-adjustment and balance of curricula and systems have proved their worth and success through the examination of the methods and experiences of developed countries in the field of education, and the curricula in Iraq, including those in the faculties of basic education, Need a comprehensive review in order to develop them by evaluating them to avoid deficiencies and strengthen the strengths of them, and from the foregoing can be formulated problem research by the following question: What is the availability of national standards for academic accreditation to evaluate the professional courses of the Department of Geography in Faculties of Basic Education?. Evaluation of the courses of the departments of geography in the faculties of primary education, which did not have an assessment process by some of the standards of national accreditation. Assist all parties to the educational process of students and teachers and the competence of educators and curriculum implementers, to disclose the strengths and weaknesses in the decisions of the departments of the Faculty of Basic Education.

**METHODOLOGY**

This chapter includes the research methodology and the procedures followed by the researcher to achieve the goal of the research. These procedures are summarised by describing the research society and how the sample was chosen to be accurate and representing the primitive community from which it was taken. In the analysis of the results, the researcher should decide the method by which he wants to study the variables of the study, because it is a crucial requirement for the design of the study, as it is vital in the sequence of steps of research. Therefore, the methodology of this study is the descriptive approach. The method of collecting data and information is based on the questionnaire. The studies that follow the detailed path are characterised by the need for sufficient effort and time, in addition to the researcher possessing special skills.

**Research community**

Many of the phenomena studied in education and psychology are in large groups of individuals that are difficult to enumerate. The researcher often resorts to examining these phenomena on small groups chosen by large groups. All the individuals represented by these phenomena are called the “”, and the identification of the study community is an essential step in educational research. It requires great accuracy as it depends on the study, the design of its tools and the adequacy of its results. The researcher visited the universities of the research society, namely the basic education colleges in Babel and Mustansiriya, and only these universities, due to the difficult security conditions and distance between the faculties, visited under the facilitation of the task book by the Faculty of Basic Education / Babylon University to the Iraqi universities. The current research of the students of the fourth stage in the geography departments of the basic education colleges at the universities of Babylon and Mustansiriya for the academic year 2017-2018. The size of the society is 100 students as shown in Table 1.

**Research Sample**

The sample, which is part of the society, carries all the characteristics of that society and represents it fully. The sampling method is followed in most field studies because it is impossible to collect statistical information from all the units that constitute the studied society. The researcher tried to choose the sample to be
representative of the original community. The sample is randomly selected. It is also the choice of the sample of the essential steps of research, and the researcher usually resort to determine the community of analysis according to the subject or the problem is the phenomenon of choice, and since the large-scale communities often, the researcher cannot study the phenomenon or event, so resort to choose a sample study from that community. The researcher chose the Faculty of Basic Education at the University of Babylon in Qusadia to represent the research community. The percentage of students is more significant than that of the basic education college at Mustansiriya University. The students were selected from the Geography Department at the college mentioned above with 10 students and 10 students. (16.7%) of the total number of students in the three universities to identify the stability of the tool and the clarity of the paragraphs and the time required to answer and the obstacles facing the application of the test. The size of the sample depends on the objective of the study and the nature of the studied society. If the members of the studied community are homogeneous, it is possible to trust the small sample. If the members of the society are heterogeneous, it is preferable that the sample is the largest guarantee for the accuracy of the implementation. After determining the original student population and excluding the survey sample, the number of students in the original sample reached (100) students as shown in Table (2).

**Search Tool**

The difference in the nature of research requires any researcher to use a set of tools, and other than the questionnaire is the most used tool in educational science, human and social and is a way to collect data by containing a set of questions and phrases and demand from the respondents to answer them. As the current research aims to evaluate the professional courses of the Department of Geography of the Faculty of Basic Education according to some criteria of national academic accreditation, this requires extensive information, so the researcher believes that the questionnaire as a tool is a suitable tool for research note that the purpose of using the questionnaire to access information and knowledge of experiences and trends and views cannot be reached by means. Directing an exploratory survey as the research requirements determine the criteria of the national academic accreditation. The researcher studied the educational literature and a number of studies related to the subject, as well as the consultation of some of the professors and concluded the topics related to the issue and was introduced to a group of experts and specialists in the field of education and science Self and teaching methods to express their views and observations in terms of addition, deletion and modification of these elements. 2. In the light of the opinions of experts and specialists, the researcher modified the questionnaire mentioned above with the addition of the information and observations obtained by the researcher from the questionnaire, and as a result, the survey was formulated in its final form according to five axes that included the objectives and consisted of two elements, the content with five parts, the teaching methods with four elements, Elements, and international cooperation in evaluating the academic program with only one element.

**Tool Validation**

It is supposed to measure the attribute designed to measure it and does not measure another characteristic. Honesty refers to the extent to which the test measures the measurement without verifying the validity of the test. In order to achieve the veracity of the questionnaire presented in its preliminary form to a committee of arbitrators and specialists in the educational and psychological sciences And methods of teaching to express their views and observations on the accuracy of the wording of paragraphs, and clarity and validity to achieve the objectives of the study, the researcher relied on 80% of the agreement of the opinion of the arbitrators on the validity of the paragraph at a minimum to accept the articles within the questionnaire, and after the researcher took the ideas of the arbitrators and their observations and suggestions in some words and the amendment of some items linguistically, and thus became the final form of the questionnaire consists of (77) divided on five axes and the researcher three alternatives OK, somewhat OK, not OK).

**Stability of the tool**

The researcher relied on the method of applying the questionnaire to measure the stability of the study instrument on a random sample of 20 students. The correlation between the application of the first and the second was 15 days. To calculate the stability coefficient
the researcher used the Pearson correlation coefficient between the two forms. The coefficient of correlation was 85%, which is a good stability coefficient.

**Statistical methods**

Pearson correlation coefficient _ percent _weighted average _ percent weight.

**RESULTS AND DISCUSSION**

Explain to the researcher after the presentation

**Table 1. The size of the society for Al Mustansiriya and Babylon University of 100 students**

<table>
<thead>
<tr>
<th>University</th>
<th>Student(female)</th>
<th>Student(male)</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Al Mustansiriya</td>
<td>32</td>
<td>67% .29</td>
<td>14</td>
<td>67%.11</td>
</tr>
<tr>
<td>Babylon</td>
<td>47</td>
<td>17%.39</td>
<td>27</td>
<td>5%.22</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>84%.65</td>
<td>41</td>
<td>17%.34</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>University</th>
<th>Student(female)</th>
<th>Student(male)</th>
<th>Total</th>
<th>Percentage</th>
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<td></td>
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<tr>
<td>Al Mustansiriya</td>
<td>32</td>
<td>32%</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>Babylon</td>
<td>37</td>
<td>37%</td>
<td>17</td>
<td>17%</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>69%</td>
<td>31</td>
<td>31%</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The content of the courses for the fourth phase of all subjects has met the criteria for accreditation of the national academic from training and students. The content of the courses for the fourth phase of all subjects has met the requirements of the national educational accreditation from the higher education from the students. The content of the courses for the fourth stage of all subjects achieved the academic accreditation criteria from the students less than the point of view of the teachers.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon Government, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effectiveness of Herrmann Model in the Achievement of Fourth-Scientific Class Female Students in Biology

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Abstract

The research aims to identify the effectiveness of Herrmann Model in the achievement of Fourth-Scientific Class female students in Biology. The researcher has adopted the partial-control experimental method to adjust the research variables. The research sample consists of 72 students (36 female students who have studied according to Herrmann model and 36 male students who have studied according to normal method). Before starting the experiment, the researcher has made an equivalence between the two groups representing in variables (age by months, students’ previous achievement in biology, testing previous information and intelligence test). Statistics have proved that the two groups of research are equivalent to those variables. After conducting the equivalence, the researcher has prepared application requirements including plans, goals and tests for the two groups of research. She has applied her research tools after completing the experiment application. After marking the students’ answers, she has obtained data for the experimental group and control group, where those data have been statistically processed by (T-test) for two independent samples. Results have shown superiority of the experimental group which has studied according to Herrmann Model over the control group which has studied according to the normal method in the studying achievement variable.

Keywords: Herrmann Model, achievement, fourth scientific class students, biology.

Introduction

Studying achievement is one of the problems leading to student’s failure in school, and this leads to frequent complaints by the school administration and teachers. The reason lies in that they are unaware of real reasons behind those students’ low grades and accordingly a continuous decrease in their studying achievement. Finally they fail and stay in the same classes for several years without finding out actual solutions for the problem. Therefore, social and educational researchers have paid attention to study the problem completely and comprehensively from all sides to discover the truth. Encouragement of studying achievement is one of schools aims over centuries through which we can measure students’ performance level and how appropriate is the curriculum. Studying achievement neither aims to compile information in students’ minds nor to get a degree to improve economic or social status. However, the real purpose of the achievement is to feed minds with knowledge and useful sciences comprehensively and gradually. As achievement and thinking are inseparable processes, insufficient achievement is accompanied by poor thinking. There is no doubt that poor achievement does not appear suddenly, but it starts with students from zero and then grows with them. Poor achievement in biology is one of the problems that students suffer from in preparatory stage; there is a defect in traditional methods followed in teaching as they concentrate on memorization and feedback. Teaching in our Iraqi schools pay attention mostly on how to make students’ minds full of information without teaching them how to learn and acquire scientific bases for different knowledge. Moreover, teachers do not care about strategies used with students in learning and accordingly they follow certain modes of teaching and thinking that encourage auto-memorization more.
than thinking leading to creativity and students’ poor learning skills. Therefore, learning has become soft and limited to studying achievement in its low levels. Brain Dominance as one of brain quadrants is dominating and it does not mean that the rest of styles are inactive (Ned Herrmann 1993). Herrmann has identified four styles of thinking which are: Logical style: it cares about a knowledge base and ability to understand and merge knowledge systems and processes. Organizational style: it cares about organization and schedule of activities and pays attention to details and creation of goals and procedures to achieve them. Social style: it shows ability to communicate socially and linguistically, its impact upon others and ability to deal with them. Creative style: it shows ability to imagine and visualize uncommon alternatives and overcome obstacles and problems that are shown during thinking and obtaining new ideas 10.

So, biology, among others, has its own and important turn in contemporary life and education, it develops the scientific thinking skills, it is no longer limited to memorization and remembering of concepts but it has become an experimental science seeking to give students skills of investigation and discovery which develop the higher levels of thinking 4. Is one of the modern sciences that we need in our daily life, it is of the important and necessary sciences as it lets us know what is in our bodies such as organs, cells and biological functions and it also make us recognize organisms and plants and what is around us in the surrounding environment 9. Brain has four lobes which are: Frontal lobe: it is the primary region of motor system and it includes 50% of the size of each cerebral hemisphere. It controls the movement through the top of two hemispheres. Temporal lobe: is the center of talking in the left side. Occipital lobe: is the visual processing center 3.

METHODOLOGY

Research Methodology and Experimental Design: Experimental design with a post-test has been selected for the experimental group and control group. This type of design is required to achieve equivalence between the two groups. The experimental design, which is based on Herrmann model, represents an independent variable while studying achievement represents a dependent.

Research Experimental Design

The independent variable includes Herrmann model and normal method, while the dependent variable includes achievement. Therefore, the researcher has used the experimental design with partial control for two equivalent groups (experimental and control).

Research Community and sample

This research community represents the students of fourth scientific class in secondary and preparatory schools (Morning study), which belong to the Directorate General of Education in Babil (City Center), for the academic year 2017-2018. These schools should have two fourth-scientific classes at least. The researcher has selected Al-Thawra Preparatory Mixed school in Babil city center randomly, it contains four classes of fourth scientific (A, B, C, D). The researcher has selected class B (36 students) randomly to represent experimental group whose students will study according to Herrmann model. In the same way, she has selected class C (36 students) randomly to represent control group whose students will study according to the normal method.

Test items output: achievement test items have been created in their primary version in the light of the test map content. She has selected the type of test (multi-choice questions, True and False, and fill the blanks) which consider of the best subjective questions. The test consists of 30 items distributed to Bloom levels of knowledge (knowledge, comprehension, application, analysis, structure and assessment) concerning the four subjects of biology book.

Test Instructions: instructions and guidelines concerning how to answer and which represented in (selecting one correct alternative choice for the item, answer all items, time for answer, writing full name, class and section in the designated place), have been drafted.

Marking the test answers: after drafting the test items, a scale has been developed to mark the answers. One grade for each correct answer and zero for the wrong answer, abandoned item that the student didn’t answer and the item that was answered by more than one choice. Accordingly, the maximum grade is 30 and the minimum grade is zero.

Test Validity: face validity and content validity have been verified. Results showed that face validity achieved 90% as a rate of agreement by arbitrators and experts. Concerning the content validity, results showed that all the achievement test items are statistically
significant. Therefore, the achievement test is valid to measure the extent of the fourth-scientific class students’ comprehension in biology.

**Exploratory Application of the achievement test**

First Exploratory Application: the achievement test has been applied in its first exploratory stage on a group of students of fourth-scientific class other than the research sample (30 students). The purpose is to recognize the clarification of test instructions and guidelines, the extent of comprehension and clarification of test items for the students and calculate the time necessary for the test where the researcher has recorded the time of completing the test for each student. By calculating the athematic average of time, it is found that time needed for answering the test items is 33, 34 seconds. Second Exploratory Application: the test has been applied on a sample of 100 students of the fourth-scientific class other than the research sample. The purpose is to analyze the achievement test items statistically, which represented in item difficulty, item discrimination and effectiveness of wrong alternatives.

**Statistical Analysis of the Achievement Test Items**: the achievement test items have been analyzed as the following: Item difficulty: by conducting statistical analysis for the achievement test items, it is found that difficulty coefficient of the items ranges from 0.36 to 0.56. Therefore, the achievement test items are considered good and their difficulty is appropriate. Item Discrimination: one of the characteristics that should be available in the test items is item discrimination which means the possibility of items to discriminate students’ individual differences. Test items are valid as the items discrimination coefficient is 0, 20 and above and the discrimination coefficient value of the achievement test ranges from 0.33 to 0.63. Accordingly, the achievement test items have a good discrimination coefficient and are considered suitable. Test Reliability: test reliability coefficient depends on relationship between one item and another or between all test items. This is apparent through its grades stability and items consistency. Test reliability coefficient can be calculated by using legal relation between the test units. Some of the characteristics of good test are validity and reliability so that test items are clear, valid and reliable at the same time. Reliability indicates a consistency of test grades when repeating it again, i.e. it refers to balanced and stabile students’ grades in the test.

**Split-half Method**: it is one of the most used methods because it avoids the disadvantages of some other methods. For obtaining two equivalent versions of the test, the researcher has divided the test items into odd and even items. By selecting the students’ answers of the exploratory sample amounting to 100 answers and by getting Peterson correlation coefficient between the grades of the odd and even items, it is obtained the reliability coefficient amounting to 0.86. As the reliability coefficient of the split-half method does not measure total homogeneity of the test (its half is reliable only). Therefore, marking the answers is made by using Spearman correlation coefficient which is 0.92 and it is a good reliability coefficient from the experts’ view.

**Kuder-Richardson Method**: Kuder-Richardson formula has been applied according to students’ grades. The researcher has found that the test reliability value is 0.82. Accordingly it is a good and suitable value and the test is reliable.

**Application of research tool**: the experimental and control groups of the research have been informed about the application time of the achievement test a week before. It has been applied after finishing the educational material specified for the two groups of the research at the same time and the researcher has supervised the test application.

**Statistical Means**: the researcher has used the T-test for two independent samples to conduct equivalence between the two groups by the following variables: (age by months, students’ achievement in the Mid-year exam of Physics, Otis-Lennon Intelligence test and SPSS).

**RESULTS AND DISCUSSION**

An achievement test has been made for both groups after completing the educational material taught by the researcher. Results show the supremacy of the experimental group over the control group and according to table 1. The table shows the experimental group supremacy over the control group in the achievement test. Therefore, there is a statistically significant level between grades average of the experimental group students who study biology according to Herrmann model and grades average of the control group students who study the same subject according to the normal method in the achievement and for the favor of the experimental group. This is consistent with previous studies that confirmed the supremacy of the experimental
group which studies according to Herrmann model over the control group which studies according to the normal method. This shows us that teaching according to Herrmann model has a positive impact on understanding information, scientific facts and interpretation of mathematical laws through cooperating groups and what students discuss and this will lead to raise their scientific level and achievement. Results of statistical processing have proved the supremacy of the experimental group’s students over the control group students. The researcher has attributed the results to one of the following reasons:

Use of Herrmann model has helped to create a free and unlimited atmosphere and enhanced the experimental group students’ confidence. Use of the logic and organizational style in this method has led to organize the female students’ thinking and increase their attention and concentration on lessons. Use of Herrmann model has given the female students the chance to participate in thinking collectively and exchange and respect opinions. The model has given a space for each student to express herself and make judgments about different opinions and ideas among them.

### Table 1. The supremacy of the experimental group over the control group

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Arithmetic average</th>
<th>Standard deviation</th>
<th>Variance</th>
<th>Freedom degree</th>
<th>T-values</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>36</td>
<td>26.02</td>
<td>6.29</td>
<td>39.56</td>
<td>70</td>
<td>2.157</td>
<td>Statistically significant</td>
</tr>
<tr>
<td>Control</td>
<td>36</td>
<td>22.65</td>
<td>6.77</td>
<td>45.83</td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### CONCLUSION

In the lights of the results reached by the research, the researcher has concluded the following: The effectiveness of Herrmann Model in the achievement of the experimental group female students in Biology. The model can make the students a center focus in the learning process through giving the chance to express opinions freely and subjectively and this meets the modern requirements of teaching. The model requires a lot of teacher’s efforts to achieve a high level of interaction between him and students in any thinking method.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Teaching Methods of Science, College of Basic Education, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

### REFERENCES


Active Lower Range of Motion (ROM)-Assisted Wooden Roller Reflexology Increasing Foot Sensitivity in Type II Diabetes Mellitus Patients

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1Nursing Department, Polytechnic of Health Denpasar

ABSTRACT

Chronic hyperglycemia in diabetes mellitus non-enzymatic glycosylation and excessive glucose to intracellular diffusion leads to structural abnormalities and capillary function as well as peripheral nerve injury. Nerve cell injury and supported by capillary dysfunction lead to neuropathy. This study aims to determine the effect of active lower ROM-assisted by wooden reflexology roller on the sensitivity on type II Diabetes patient’s. The design was quasi experimental with pre and posttest non-equivalent control group design on 36 respondents selected by purposive sampling at PHC I North Denpasar and control at PHC II Abiansemal. The result showed that the average sensitivity of the respondent’s feet in the treatment group increased from 11.56 to 17.17 with the result of the paired t test is 0.00, it means there is influence of the exercise on the foot sensitivity, while the sensitivity of the control group’s foot increases from 11.44 to 11.50 but the result of Wilcoxon Sign Rank Test is 0.91 and means no significant changes on patient’s foot sensitivity. The difference average between these two groups was tested with Mann Whitney U Test obtaining result 0.00 which stating that there was a significant difference between the treatment and control group. Based on that, it’s suggested to the health service unit to arrange procedure so this exercise can be applied to DM patient.

Keywords: neuropathy diabetic, active lower ROM, wood reflection

INTRODUCTION

Diabetes Mellitus (DM) is a chronic condition that occurs when glucose levels in the blood is increasing because the body cannot produce insulin or use insulin ineffectively, type II DM is the most common case of diabetes. Approximately 90% of patients have DM type II of all cases of DM.

In type II of DM, chronic hyperglycemia occurs due to insulin resistance so that tissue becomes ineffectively to take glucose. This condition may cause Diabetic Neuropathy (ND).

ND is characterized by decreased foot sensitivity like thickness, tingling, pain, and burning. A research suggests that 84.37% of patients experience decreased foot sensitivity ranging from moderate sensitivity to not feel the touch at all. Another study also revealed that the mean sensitivity of the patient’s foot decreased to 3.07 (standard deviation = 1.71) in the treatment group and 3.73 (standard deviation = 1.79) in the control group before doing exercise.

The disorder is characterized by loss of pain sensation and inability to feel the temperature changes arising as a result of minor sensory nerve damage (C-fiber), whereas the disturbance manifested by loss of sensation when touched or given vibration, proprioception, motor neuronal disorders is the result of major neural damage (A-Delta). Peripheral neuropathy may occur with or without early symptoms. Initial symptoms perceived by diabetics include loss of sensation and ongoing pain. A study in the United States showed that about 15% of DM patients are estimated to have DF at sometimes in their lives, and the study also found that 60-70% of DF starts
from neuropathy \(^{(10\text{in}\text{11})}\).

Efforts to treat symptoms of sensitivity decreasing are necessary to prevent neuropathy. The DM management strategy with complaints of sensitivity decreasing is divided into three parts. The first strategy is diagnosing as early as possible, then the second one is doing the best glycemic control and foot care, and the third strategy aimed at controlling the complaints of sensitivity decreasing after the second strategy is implemented. Foot care can be done by keeping the skin clean and avoid foot trauma\(^{2}\).

One of physical exercise that can be applied to DM patients is ROM exercises to increase muscle strength, increase joint flexibility, and decrease plantar foot pressure \(^{12}\). When the contraction occurs, blood will flow into the vein and will be refilled from the arteries during relaxation vase. Blood in the veins will not return to the original blood vessels because there are venous valves\(^{13}\). Increased blood flow can encourage the production of NO which can keep the endothelial (the lining of the walls). NO can stimulate the formation of \textit{endothelial derive relaxing factor} (EDRF) which plays an important role in vasodilatation or dilation of the arteries. NO also plays an important role in keeping blood pressure normal\(^{13}\).

Reflexology can stimulate the decrease of HbA1c so that sorbitol doesn’t accumulate and the production of NADPH co-factor increases. Reflexology technique in this study using wooden reflexology. As described in chapter two that this reflective wood has an elongated shape with a smooth bulge surface that can squeeze as well as massage the reflexology point on the sole of the foot but does not pose a harm to the patient’s foot. Sliz \textit{et al}. in 2012 explained that reflexology therapy can be done with a tool made of wood. The wood is rolled on the floor using the soles of the feet. The cerebral system will suppress the amount of pain signals entering the nervous system by activating a pain system called analgesia when the pressure point is massaged or touched and given a flow of energy\(^{16}\). When the massage creates a pain signal, the body pulled out morphine which secreted by the cerebral system so that it relieves pain and creates a pleasant feeling (\textit{euphoria}). The reaction of the body’s reflexology will excrete the neurotransmitters involved in the analgesia system, especially the encephalin and endorphins that play a role in inhibiting pain impulses by blocking the transmission of these impulses in the cerebral and spinal cord systems\(^{16,17}\).

**MATERIALS AND METHOD**

This research was conducted using \textit{quasi experimental, pre and posttest non-equivalent control group design}. The number of samples used were 18 people in each group selected according to the inclusion and exclusion criteria: men and women who were willing to be respondents in this study, aged between 40-79 years, had a history of having type II DM \(\geq 3\) years, not with joint, heart, and shortness of breath, not experiencing complications of diabetic ulcers (already injured and under treatment), and not with a history of trauma or injury (currently in the treatment stage).

Active role of ROM assisted wooden roller Reflexology was done twice a day in two weeks starting from April 21\(^{th}\) until May 5\(^{th}\) 2018 at Public Health Center (PHC) I North Denpasar and PHC II Abiansemal. The foot sensitivity data of both groups on the pre- and post-exercise were measured using the \textit{Semmes Weinstein 10gmonofilament}. The data analysis used is univariate analysis and bivariate analysis using \textit{paired t-test, Wilcoxon Sign Rank test, and Mann U Whitney test}.

**RESULTS**

The result of bivariate analysis on this research is as follows: From 20 points that have been tested using monofilament at pretest, the respondent can still feel the stimulation with the average sensitivity of the of the respondent in the treatment group before the training is 11.56 (standard deviation 1,338) and control group is 11.44 (standard deviation 1.69).

Final measurements (posttest) showed that from 20 points tested again using monofilament, there was an increase in the level of sensitivity of the respondents in the treatment group after the active lower ROM-assisted wooden roller reflexology was 17.17 (standard deviation 1.75) and the control group was 11.50 (standard deviation 1.69).

Meanwhile, respondents who still cannot feel the stimulus (neuropathy) at certain points are presented in the table below as follows:
Table 1. Distribution of Neuropathy at Checkpoint of Respondents’ Foot Before and After Given Exercise

<table>
<thead>
<tr>
<th>Check Point</th>
<th>Treatment Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Right</td>
<td>Pre</td>
</tr>
<tr>
<td>a</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>b</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>c</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>d</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>e</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>f</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>g</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>h</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>i</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>j</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Description:

Based on these data, it can be seen that the MTH point has neuropathy nearly on both legs and both groups of respondents before given exercise. Meanwhile, the final test shows the number of respondents who experienced neuropathy in the treatment group less than the control group.

The result of paired t-test in the treatment group and the Wilcoxon Sign Rank Test in the control group obtained the data of sensitivity level of patient’s feet DM type II presented in the form of picture below:

Figure 1. Comparison of Patient’s Foot Sensitivity Level Before and After Giving Exercise on The Treatment and Control Group

DISCUSSION

The result of the research shows before doing active lower ROM-assisted wooden roller reflexology, the average in the treatment group is 11.56 with the standard deviation 1.338. Based on the results of this study, the number of respondents who can feel the point of MTH 3 on the right and left foot of the treatment group and left foot of the control group is less than at the other point. A study proves that the highest plantar pressure is found on the feet of the MTH section18. Biomechanically, of the three sites with the highest incidence of ulceration (heel, metatarsal, and thumb), there is a plausible explanation for why only metatarsals are associated with higher plantar pressure. The upper part of the MTH is the back of the foot which bearing the weight of body more than the weight at each step. The MTH region is a heterogeneous and complex part with many types of soft and thin plantar tissue. In contrast, the heel and thumb have a simpler anatomy (skin, plantar fat, and bone) with a thicker plantar soft tissue19.

The patients’ foot sensitivity before and after exercise is different. The level of sensitivity of the patient’s foot after being given active lower ROM-assisted wooden roller reflexology exercises for 2 weeks increased from an average of 11.56 to 17.17 at the post test level by a margin of 5.61. The result of the statistical test using paired t test obtained the p value (Sig. 2-tailed) of 0.000 (p value<0.05), it shows that there is significant difference between the sensitivity level of the patient’s foot before and after given exercise.
A study showed that the patient’s foot sensitivity level was increased after reflective massage therapy from 11.38 to 13.63 with \( p \text{ value} 0.000 \) \((p < \alpha)\), this result means that there was a significant difference between the mean sensitivity level of the feet before and after in the experimental group. The other ones also showed an increase in the mean sensation of intervention group protection after being given active-less ROM exercises from 2.38 to 4.58 and the results showed a significant difference between \( \text{pre} \) and \( \text{posttest} \) with \( p \text{ value} = 0.00 \) and \( \alpha = 0.05 \).

Those above studies and this study have similarities to prove that there is significant influence of the exercise given to the treatment group, but the margin is different. The average difference of treatment group in this study was 5.61, while Lisnawati’s research was only 1.69 and Widyawati only 2.2. In this case the two previous studies and this study both used the physical exercise method as an independent variable, but the form of exercise given was different. Lisnawati applied the reflexology massage and Widyawati applied the active lower ROM exercises in the treatment group while in this study combined those two into the active lower ROM-assisted wooden roller reflexology (wood as a means of reflexology session). Thus it can be proven that their collaboration resulted in increased leg sensitivity more than previous studies.

The results showed that \( \text{pretest} \) the control group showed an average of 11.44 with a standard deviation of 2.255. The sensitivity level of type II diabetic patients in \( \text{pre} \) and \( \text{posttest} \) has a difference. The foot’s sensitivity level at \( \text{posttest} \) increased from an average of 11.44 to 11.50 with a difference of 0.06. However, the result of statistical test using Wilcoxon Sign Rank Test showed \( p \text{ value} \) of 0.908 \((p \text{ value}> 0.05)\) so it can be concluded that there is no significant change of sensitivity of DM type II patients in the control group in both \( \text{pre} \) and \( \text{posttest} \).

A similar study conducted by Lisnawati and Hasanah proved that the average sensitivity level of the foot in the control group increased by 0.09 but \( p \text{ value} 0.334 \) \((p > \alpha)\) which means no significant influence between \( \text{pre} \) and \( \text{posttest} \). The control group’s respondents only received standard treatment such as education, elderly gymnastics, and examination with standard drug i.e. Metformin 500 mg which was held regularly every week at PHC. The education provided at both PHC is not helpful in relation to the delivery of material that is often poorly understood by the patient. This is evidenced by the results of interviews, which most patients say do not know about complications that may occur when the DM is uncontrolled. The gymnastics have not met the standard of Control and Prevention of Type 2 Diabetes Mellitus by PERKENI and do not specifically resolves the symptoms of decreasing the sensitivity of the patient’s foot such as tingling, thickness, and numbness in the sole of their foot\(^{21-23}\).

The statistic result of Mann Whitney U Test in this research shows that \( p \text{ value} = 0.00 \) \((p \text{ value}< 0.05)\) so it can be concluded that there is a significant difference between treatment groups given active role ROM assisted wooden roller reflexology with control group which only given standard treatment. Based on the results of research can be proved that active role ROM assisted wooden roller reflexology more effectively improve the sensitivity of the foot better than doing standard treatment.

**CONCLUSIONS**

This study found that: 1) The mean \( \text{pretest} \) of sensitivity level of respondent of treatment group was 11.56 and control group was 11.44; 2) The average \( \text{posttest} \) of respondent group’s sensitivity level is 17.17 and control group is 11.50; 3) There were significant differences in values of \( \text{pre} \) and \( \text{posttest} \) sensitivity of DM type II patients in treatment group by 0.61 and \( p \text{ value} \) 
\( (\text{Sig. 2-tailed}) \) of 0.000 \((p \text{ value} < 0.05)\); 4) There was no significant difference in values of \( \text{pre} \) and \( \text{posttest} \) sensitivity of DM type II patients in control group with difference 0.06 and \( p \text{ value} \) \( (\text{Sig. 2-tailed}) \) of 0.908 \((p \text{ value}> 0.05)\); and 5) There was an influence of active lower ROM-assisted wooden roller reflexology on the sensitivity of DM type II patients in treatment group with \( p \text{ value} \) \( (\text{Sig. 2-tailed}) \) of 0.001 \((p \text{ value} < 0.05)\).

**COMPETING INTERESTS**

The authors declare that they have no competing interests.

**Ethical Clearance:** Ethical clearance was obtained from the board of ethics committee of Politeknik Kesehatan Denpasar and respondent’s approval.

**Source of Funding:** Politeknik Kesehatan Denpasar, Bali
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Glass Fish (*Kurtus Gulliveri*) Reproduction Aspects at Kumbe River Estuary, District of Merauke, Province of Papua, Indonesia

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ABSTRACT

Kumbe River estuary has strategic roles for fish resource sustainability located in District of Merauke. *Kurtus gulliveri* is a kind of original fish found only in the southern part of New Guinea Island with crucial economic value. This research aims for analyzing *Kurtus gulliveri* reproduction aspects which is found as dominant fish in Kumbe River estuary. It applies survey method by having three research stations in Kumbe River estuary. Fish samples have been collected for six months, from February to July, 2016. The mesh size of catching tool is 1; 1,5; 2 inch gillnets and seine shores. The samples that have been collected are preserved with 10% formalin. Reproduction parameters are sex ratio, Gonad maturity level, gonad maturity index and fecundity. Total sex ratio is unbalanced with comparison of 1:2,5 which means that number of male fish is lower than females. The highest gonad maturity level is at level IV in May. It indicates that fish are in spawning time and the highest time occurs in May, therefore, fishing should not be allowed in that month. Fish fecundity is ranging from 449 to 14.441 averaged 4.766 (±2.950). Based on this study, we found that the time for catching with high efficient and effective is in May due to the size and the amount of Glass fish is highest.

Keywords: Reproduction, Fish, Estuary, Kumbe, Kurtus gulliveri

INTRODUCTION

An estuary is a transition zone between freshwater and seawater which is a quite unique area marked by salinity fluctuation happening all day. Nevertheless, estuary becomes an essential habitat for fish live stages. This area is quite productive supporting various aspects of fish live (Kimirei et al.,¹, and functions as areas of spawning (Chaves & Bouchereau², nurturing³ (Bonecker et al.,⁴ Huijbers et al.,⁵ searching for food⁶ and migrating. Several studies on estuary have been conducted in Indonesia⁷-¹⁰.

District of Merauke lies in the southern part of Province of Papua and directly adjacent to Papua New Guinea. As the result, it is enriched by many kinds of typical flora, fauna and macro organism. Many researchers also have been attracted by its geology histories such as Merauke was once sharing the same island with Australia therefore some flora and fauna are still related to Australia such as Kangaroo (Marsupialia) and several kinds of endemic fish. There are about 34 kinds of fish that have been reported in this area¹¹. The southern part of Papua has relatively low land. This condition causes inland waters and marine waters influence aquatic system of this area. Mostly, it influences tidal system of estuary.

Kumbe River is one of big Rivers located in District of Merauke. Kumbe River estuary has important roles for the sustainability of fish resource at District of Merauke. Various activities of anthropogenic occurring in area estuary are estimated influencing the sustainability of...
fish in that ecosystem. Management effort needs to conduct in order to keep the sustainability of fish in this area. Therefore, information and knowledge of biologic characteristics of fish such as reproduction aspects as basic for management are essential.

The dominant fish found in Kumbe River are Snapper (*Lates calcalifer*), Threadfin (*Eleutheronema tetractylyum*), Blue-spot Mullet (*Mugil sp*), Glass Fish (*Kurtus gulliveri*), and Greenback Croaker (*Johnius sp*.) As we know, the data of reproduction aspects are not been reported elsewhere, therefore the aims in this study is to analyze reproduction aspects of glass fish (*Kurtus gulliveri*) which is found as a dominant fish in Kumbe River estuary. It is expected that this information can give contribution in managing and catching time of the glass fish.

**MATERIALS AND METHOD**

**Research Site and Research Time**

Research site lies in Kumbe River, District of Merauke, Province of Papua (Figur 1). Data collection has been done for six months, From February to July, 2016). Research stations are determined through purposive sampling which is the determination of zone based on land environment characteristic, fish habitat type, and catching area considerations. Based on those considerations, three stations have been determined:

Station 1: coastal area of Kumbe
Station 2: estuary
Station 3: coastal area of Kaiburse

**Figure 1. Map of sampling site**

Data Collection and Data Analysis method

Fish samples are collected for six months in the research stations. The catching tools are gillnets with 50 m width and 3 m length, sizes are 2”; 2,5”, 3”, 3,5”, and 4” for each. Each fish sample found in each station is placed in plastic bag contained 5% and 10% concentration of formalin. Then, each plastic bag is labeled with information of station number and date of collection. All caught fish are brought MSP laboratory for further analysis. The fish will be grouped based on their type and sex.

Fish types are identified according to, especially the sex is determined based on fish secondary sexual characteristics. Each fish sample is measured its total length and standard using 1 mm measurement board and the weight is measured using 0,01 gram balance. Further, fish gonad is discharged by cutting and opening. Determination of gonad maturity level is conducted through gonad morphologic observation.

Female fish that have achieved gonad maturity level of III and IV will be measured its fecundity. The equation to calculate fecundity is:

\[ F = \frac{WG}{Wg} \times \frac{WG}{Wg} \times f \]

\[ F \ :	ext{total fecundity (grain)} \]
Sex ratio is analyzed by comparing number of male fish and female fish from the same species revealed in each station and has been observed during six months. The sex ratio is calculated using the following equation:

\[ X = \frac{J}{B} \]

\[ X : \text{Sex Ratio} \]

\[ J : \text{Number of male fish} \]

\[ B : \text{Number of female fish} \]

Then, to calculate the steadiness between male and female fish, \( \chi^2 \) test is applies. The following formulation is:

\[ \chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} \]

\[ \chi^2 : \text{\( \chi^2 \) value} \]

\[ O_i : \text{Encountered male or female fish frequency} \]

\[ E_i : \text{Expected male or female fish frequency (1 : 1)} \]

Biotic potential is estimated based on fecundity obtained during this research. Biotic potential will describe in what extent mother of fish will produce descents and maintain viability of its species comparing to other species living in the same time and location.

**RESULTS AND DISCUSSION**

**Sex Ratio**

Sex ratio of glass fish during research generally shows unequal pattern (Table 1). Balanced pattern had been showed in March by having \( \chi^2 \) value of 0.22 < 3.84, whereas in February, April, May, June, and July, it shows unbalanced pattern.

**Table 1. Sex Ratio of Glass Fish based on Observation Months**

<table>
<thead>
<tr>
<th>Month</th>
<th>Male</th>
<th>Female</th>
<th>Sex</th>
<th>( X^2 ) Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>2</td>
<td>19</td>
<td>1 : 9.5</td>
<td>13.76ns</td>
</tr>
<tr>
<td>March</td>
<td>19</td>
<td>22</td>
<td>1 : 1.6</td>
<td>0.22s</td>
</tr>
<tr>
<td>April</td>
<td>23</td>
<td>56</td>
<td>1 : 2.43</td>
<td>13.78ns</td>
</tr>
<tr>
<td>May</td>
<td>17</td>
<td>48</td>
<td>1 : 2.82</td>
<td>14.78ns</td>
</tr>
<tr>
<td>June</td>
<td>7</td>
<td>45</td>
<td>1 : 5</td>
<td>18.67ns</td>
</tr>
<tr>
<td>July</td>
<td>6</td>
<td>16</td>
<td>1 : 2.67</td>
<td>4.55ns</td>
</tr>
</tbody>
</table>

Note: s: significant different; ns: no-significant different

It is revealed different morphology shape between male and female fish, thus, it is easier to find out the sex of this kind of fish. The males are relatively slender while the females are relatively broad. The main characteristic to distinguish it is that on males’ head, fishhook-like indentation is found while none is found on the females’ (Figur 2).

**Figur 2. Glass fish (top male and above female)**

During six months observation of sex ratio, overall, it reveals that number of the female fish is higher than the males. It indicates that amount of this fish is still good and stable. Regarding to this data, during spawning time, the amount of female fish is higher than male fish or one male fish that has had gonad maturity must be able to fertilize eggs from more than one female fish. This is also found in some of endemic fish such as *Mesopristes cancellatus* Openiano et al.,21 *Girardictys multiradiatus* in Mexico, Adolfo et al.,22 and *Glossolepis inciscus* in Sentani Lake in Jayapura, Indonesia23.

Besides the higher amounts of female fish, some research also report that some types of freshwater and
estuary fish have balanced sex ratio (1 : 1), such as Terapontidae family found in Alligator River, Australia; *A. percoides*, and *H. fuliginosus*24.

Gonad Maturity Level

Maturity level of fish is varied between male and female. Gonad maturity levels of male fish are I and II and gonad maturity levels of female are I, II, III, and IV (Figur 3, and 4).

**Figur 3. Graphic of Gonad Maturity Level of Male**

**Figur 4. Graphic of Gonad Maturity Level of Female**

Finding reveals that reproduction stage of glass fish is found in April, May, and June. The highest spawning time occurs in May which is the end of rainy season. The same thing is happened on some of freshwater endemic fish such as *Schizothorax o’connori* in Yarlung Tsangpo River, Tibet in which the spawning time occurs in February-April. Study by (Ma et al.,25 spawning time of *Leptobatia elongata* occurs in May-June in Yalong and Yangtze River, China Yin et al.,26, spawning time of *Aspius varax* is in March in Euphrates River, Syria.
(Saleh et al.,27 and spawning time of Cobitis faridpaki is in May-July in Siahrud River, Iran by Sabet et al.,28. Spawning time of each fish is different one another according to the type of fish and place of spawning.

**Biotic Potential**

Fecundity value of glass fish during research is ranging from 449 to 14.441 with average of 4.766 (±2.950) out of 23 fish that have gonad maturity level of III and 23 fish that have gonad maturity level of IV. Fecundity result draws the biotic potential of the fish. Generally, fecundity of either native fish species or endemic fish species is lower than invasive fish species. The varied number of fecundity is related to reproduction strategic of the fish and related to adaptation with its environment. For example, fecundity of some endemic fish such as Glossolepis incisus in Sentani Lake, Jayapura, Indonesia is ranging from 910 to 3.122 by Siby et al.,23; Telmatherina celebensis in Matano Lake, Sulawesi Selatan, Indonesia is ranging from 297 to 1.265 by Jayadi et al.,29; Paratherina aurich in Towuti Lake, Sulawesi Selatan, Indonesia researcher Nasution et al., 201030; Neolissochilus soroides in Gombak River, Malaysia is ranging from 803 to 6.218 by Khaironizam and Ismail31

**CONCLUSION**

Sex ratio is unbalanced with comparison of 1:2.5. Spawning time occurs in April, May and June and the highest time is in May. Therefore, fishing should be limited or even banned in research site during these months.

Fecundity is ranging from 449 to 14.441 with average of 4.766 (±2.950).

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**Conflict of Interest:** None

**Ethical Research:** Obtained from University committee

**Financial Research:** Directorate Research of higher Education of republic of Indonesia

**REFERENCES**


An Analysis of Factors Affecting Pregnant Woman’s Use of Prevention of Mother-to-Child Transmission Services in Urban Setting

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ABSTRACT

Background: The Indonesian government has provided an integrated counseling and HIV testing service to prevent MTCT (Mother to Child Transmission) of HIV/AIDS. Unfortunately, many pregnant women do not take benefit of this service. The study was to understand the reasons why women refuse to participate in preventing MTCT in Medan, Indonesia.

Material and method: This is case-control study, conducted in the working area of Padang Bulan Health Centre (Puskesmas) in the city of Medan. As many as 65 pregnant women willing to take the HIV test are selected as “the case group” while 65 unwilling as “the control group.” Variables considered in this case-control study are socio-demography, knowledge, attitude and husband’s support.

Results: Knowledge, attitude, and husband’s support variables of the case and control groups are significantly different (p<0.05). Supporting husband variable is extremely important since a wife should ask her husband for approval before taking the test. In the final result, the attitude variable obtains OR 3.27 (95% CI:1.50-7.11) while the husband’s support variable, OR 4.85 (95% CI:2.08-11.29).

Conclusion: Pregnant woman’s decision to take HIV test is closely related to her and her husband’s decision. Therefore, those who are in charge of the MTCT program should be able to convince pregnant women of the importance of HIV test, and encourage husbands to be more supportive in taking care of their wives’ health matters.

Keywords: HIV/AIDS; MTCT; VCT; urban setting; Indonesia

INTRODUCTION

The HIV transmission to child usually comes from a HIV-positive mother (or mother-to-child transmission/MTCT)⁴. According to the WHO, due to the absence of any intervention, transmission rates range from 15% to 45%⁵. This transmission can be reduced to 5% with effective interventions during the periods of pregnancy, labour, delivery and breastfeeding⁶. Interventions will be more effective if the presence of HIV virus in pregnant woman can be detected as early as possible by integrated VCT services⁷. By identifying a woman’s HIV status, the prevention of the MTCT vertically-transmitted infection can be done immediately⁸.

According to the HIV-AIDS in Indonesia reports, cases of HIV/AIDS in this country are concentrated in the provinces with urban settings, including North Sumatra Province. Up to the year of 2016, the North Sumatra Province ranked the 7th among the provinces in Indonesia on the number of AIDS case reports⁹. Medan city, the capital city of North Sumatra Province, contributed to the highest number of HIV/AIDS patients.

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Currently, there are 690,000 Indonesian people living with HIV, and 73,000 of them are newly infected. The number of women living with HIV is 250,000 people. Given that the women living with HIV are those belonging to the reproductive age, MoH has endorsed the MTCT prevention program by means of the integrated counseling and HIV testing service. There have been 3,771 integrated counseling and HIV testing service centers available nationwide. These centers have given services to merely 6% of pregnant women in Indonesia. This fact is certainly discouraging since Indonesia is categorized as a country with a high-level HIV epidemics. The failure to address HIV/AIDS epidemic will bring catastrophic consequences to the country.

Several previous researches have attempted to examine the factors contributing to the public apathy to have the benefit of Voluntary Counseling and Testing (VCT) services. The low participation to take VCT services is closely related to gender issues in which women are not able to make decision for their own interests, and pregnant women’s fear of eliciting negative responses from their partner. The location of ART as the reason for not participating in the therapy. Other reasons are education level, marriage status, and socio-economic status. Younger women tended to receive VCT.

Information about why people are willing or unwilling to undergo VCT is very limited. More researches to gather information about the reasons why women refuse to participate in preventing MTCT are of importance. This information is necessary for the sake of increasing more participation in addressing HIV/AIDS issues in Indonesia.

MATERIAL AND METHOD

Study Location and Study Setting

This research was conducted in Medan city, the western part of Indonesia. Medan city is composed of 21 sub-districts. Medan city greatly contributes to the number of HIV/AIDS cases. In 2014, North Sumatera had 2,129 HIV cases, much higher than 1,603 cases in 2013. From the total HIV/AIDS cases in North Sumatra Province in 2014, Medan city as the capital town contributed 37.79%.

This research analyzes 130 samples from 65 cases, namely, pregnant women who wanted to participate in the HIV test, and 65 controls, namely pregnant women who did not want to participate in the HIV test.

Research Variables

The researcher measured the variables from the questionnaire. Before its distribution, the researcher pre-tested the questionnaire to 20 pregnant women visiting Bestari Medan Health Centre. This particular location was selected because it shares the same characteristics with Padang Bulan Health Centres. Both provide HIV test for pregnant women. The researcher also conducted validity and reliability tests.

Data Analysis

All independent variables were tested by applying the chi-square test on 95% CI. The purpose was to find out whether or not the respondents wanted to participate in the HIV test (dependent) by considering the statistical differences of the case and control groups. Independent variables with p < 0.05 were then tested with a multiple logistic regression by using dependent variables to obtain the OR value on 95% CI.

RESULTS

Table 1 shows that around half of the case group respondents were pregnant women whose husbands were with high mobility, while only a quarter applied to the control group respondents. More than half of the respondents’ parity was ≤1, with a slightly higher proportion in the case group respondents. From all the demographic variables above, only the husband’s support sub-variable that significantly affected the pregnant women’s decision to participate in the HIV test, that is, with p < 0.05, (OR: 2.31, 95% CI: 1.09-4.89).
Table 1. Effects of Socio-demographic Factors in the HIV Test Participation

<table>
<thead>
<tr>
<th>Sosio-demography</th>
<th>Participating in the HIV Test</th>
<th>Not Participating in the HIV Test</th>
<th>p value</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 35 years of age</td>
<td>5 (7.7)</td>
<td>9 (13.8)</td>
<td>0.396</td>
<td>0.51 (0.16-1.64)</td>
</tr>
<tr>
<td>≤ 35 years of age</td>
<td>60 (92.3)</td>
<td>56 (86.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>60 (92.3)</td>
<td>58 (89.2)</td>
<td>0.762</td>
<td>1.44 (0.43-4.82)</td>
</tr>
<tr>
<td>Low</td>
<td>5 (7.7)</td>
<td>7 (10.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woman’s Working Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>37 (56.9)</td>
<td>28 (43.1)</td>
<td>0.161</td>
<td>1.74 (0.87-3.49)</td>
</tr>
<tr>
<td>Not working</td>
<td>28 (43.1)</td>
<td>37 (56.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband’s mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High mobility</td>
<td>28 (43.1)</td>
<td>16 (24.6)</td>
<td>0.041</td>
<td>2.31 (1.09-4.89)</td>
</tr>
<tr>
<td>Low mobility</td>
<td>37 (56.9)</td>
<td>49 (75.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 1</td>
<td>27 (41.5)</td>
<td>29 (44.6)</td>
<td>0.859</td>
<td>0.88 (0.44-1.76)</td>
</tr>
<tr>
<td>≤ 1</td>
<td>38 (58.5)</td>
<td>36 (55.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ANC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 2</td>
<td>59 (90.8)</td>
<td>59 (90.8)</td>
<td>1.000</td>
<td>1.00 (0.30-3.28)</td>
</tr>
<tr>
<td>&lt; 2</td>
<td>6 (9.2)</td>
<td>6 (9.2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 presents the results of the cross tabulation between the respondents’ knowledge variable and their husband’s support to take HIV test.

Table 2. Effects of Pregnant Women’s Knowledge, Attitude, and Husband’s Support to Pregnant Women’s Participation in Taking the HIV Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Participating in the HIV Test</th>
<th>p value</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participating</td>
<td>Not Participating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>49 (75.4)</td>
<td>36 (55.4)</td>
<td>0.027*</td>
</tr>
<tr>
<td>Less Good (poor)</td>
<td>16 (24.6)</td>
<td>29 (44.6)</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>46 (70.8)</td>
<td>28 (43.1)</td>
<td>0.003*</td>
</tr>
<tr>
<td>Less Good (poor)</td>
<td>19 (29.2)</td>
<td>37 (56.9)</td>
<td></td>
</tr>
<tr>
<td>Husband’s support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>32 (49.2)</td>
<td>11 (16.9)</td>
<td>0.001*</td>
</tr>
<tr>
<td>Less Good (poor)</td>
<td>33 (50.8)</td>
<td>54 (83.1)</td>
<td></td>
</tr>
</tbody>
</table>
The pregnant woman group participating in the HIV test also reflected more positive attitudes (around 70.8%), while the percentage of the group not participating in the HIV test was only 43.1% with \( p=0.003 \) (OR=3.19, 95% CI: 1.54-6.61). Similarly, the percentage of husbands supporting their wives to take HIV test was 49.2%, much higher than the percentage of husbands who did not support their wives to take the test (16.9%) with \( p<0.05 \) (OR=4.76, 95% CI: 2.11-10.70).

### Table 3. Final Model of the Multivariate Testing

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive attitude</td>
<td>1.185</td>
<td>0.003</td>
<td>3.27</td>
<td>1.50-7.11</td>
</tr>
<tr>
<td>Husband’s support</td>
<td>1.580</td>
<td>&lt; 0.001</td>
<td>4.85</td>
<td>2.08-11.29</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-1.587</td>
<td>&lt; 0.001</td>
<td>0.20</td>
<td></td>
</tr>
</tbody>
</table>

A multiple regression logistics test also indicates that those variables are of great significance for the pregnant women’s participation in the HIV test. The positive attitude variable shows \( p<0.05 \) (OR=3.272, 95% CI:1.50-7.11), while husband’s support makes a bigger impact, with \( p<0.05 \) (OR=4.85, 95% CI: 2.08-11.29).

**DISCUSSION**

The growing number of pregnant women with HIV/AIDS has become an alarming trend. In 2012, MoH mentioned 15,517 cases of pregnant women with, and this number was believed to increase to reach 19,636 cases in 2015\(^{11}\). Considering the seriousness of this condition, Indonesia is a dire need of taking drastic measures to deal with the mother-to-child HIV transmission. Efforts to prevent MTCT (Mother to Child Transmission) of HIV/AIDS should be integrated with VCT clinic. Every pregnant woman should be actively encouraged to take the HIV test. Consequently, any factor hindering pregnant women to take the HIV test should be examined as early as possible for appropriate anticipations and measures.

This present study suggests that demographic characteristics do not correlate with pregnant women’s participation to take the HIV test. Age (pregnant women who are ≤ 35 and > 35 years of age), in fact does not become the determining factor in pregnant women’s participation to take the HIV test (\( p>0.05 \)). Previous researches did indicate that those with older ages tended to undervalue the importance of the HIV test. This fact is understandable since the elder women’s awareness of HIV/AIDS is not as high as the younger ones’.

In addition, elder women are usually occupied with domestic duties, and as a result, they miss taking care of themselves in health facilities\(^{13}\). By contrast, those facts do not apply in the case of Burkina Faso. In this country, women with older ages develop more independence in making decisions, including the one to receive VCT\(^{15}\).

The chi-square test indicates that the pregnant women’s high level of education (both for those pregnant women participating and not participating in the HIV test) does make significant contribution to respondent’s awareness of HIV/AIDS. Education helps someone to make right decisions in life. However, as a research in Tanzania shows women with higher levels of education are inclined to think that they have a lower risk of HIV infection\(^{13}\). As a result, they do not perceive HIV test as something important.

This research finds out that the majority of the pregnant woman respondents works at home and their husbands have low mobility. However, these facts do not make an impact to the women’s participation in the HIV test. A previous research reveals that women with high incomes refuse to take the HIV test\(^{13}\). This fact also makes sense because working women are most likely to miss health treatments.

The parity of pregnant women is of no significance in this research. This finding is different from those in the previous researches. The higher parity the pregnant women achieve, the lower participation they involve in the HIV test\(^{15,16}\).

For the pregnant women, health facility is not supposed to be an unfamiliar place because most of them have visited the facility for ANC ≥ 2. As Sarker points
out that pregnant women visiting a health facility for ANC are most likely to take the HIV test. Those having good experiences with health services are normally responsive to health services offered in a health centre. On the contrary, bad experiences only lead people, i.e. pregnant women, to stay away from the health centre, and therefore, lose their opportunity to take benefit from the health service.

Knowledge, attitude, and husband’s support are statistically significant in this research. In the Gambella Region, Ethiopia, pregnant women with poor information about the importance of HIV test are 1.88 more likely to resist taking the HIV test during ANC. Those adopting a positive attitude towards HIV prevention are most likely to take the HIV test.

This research confirms that husband plays the role of a decision maker in the family, including the decisions related to his wife’s health issues. He is considered to have the authority over wife. A wife, for example, requires her husband’s approval to take the HIV test (Figure 1). In his research, Dahl finds out that the main reason for a pregnant woman’s refusal to visit ANC facility is that she has to discuss this matter with her husband beforehand. The importance of husband’s approval is also reported by other researchers.

A pregnant woman’s fear of taking the HIV test without her husband’s approval is the possibility of obtaining a positive result in the test. A positive result of HIV brings serious consequences for her, such as, accusation of marital infidelity, physical violence, and even divorce.

In order to increase the efficiency of VCT, the Indonesian government, especially MoH, should understand the social contexts of pregnant women’s health-related decisions. The government could make use of these social contexts to make positive impacts. Husband, for instance, can be delegated to become a promoter of pregnant woman’s HIV test. With this strategy, a pregnant woman feel comfortable to visit health centre for VCT. It is, of course, more preferable if a husband manages to accompany his wife to seek for VCT.

**CONCLUSION**

The prevention of HIV transmission is effective when every pregnant woman takes the HIV test. This research concludes that pregnant woman’s positive attitude towards HIV test and husband’s support for his wife to get maternal treatments are the most dominant variables in this research. This research hopefully offers insights into the modification of the current MTCT program.

**Ethical Clearance:** Obtained from university committee

**Conflict of Interest:** Author have none to declare

**Source of Funding:** From researchers their self

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Health Risk Assessment of Coliform Bacteria Contamination in the Dug Well Water with Qmra to Predict Public Health Risk in Small Island, Makassar

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ABSTRACT

Dug wells become the main choice for small islanders because dug wells are easier to obtain than other clean air. Coliform bacteria is an indicator of pathogenic bacteria in airborne microbial contamination. The problem of pollution of the island is growing with the increasing of population density on a small island. Quantitative Microbial Risk Assessment (QMRA) has been widely used in several studies to estimate health impacts associated with water use in coastal areas. This research was conducted in Bonetambung Island Makassar City. Examination of concentration levels of coliform bacteria using MPN method with health risk assessment to predict public health risk using QMRA. Bonetambung Island Makassar City obtained the result that from 10 points of water sampling dug well, only 1 point that meet the limits of coliform bacteria contamination, which is 4 MPN. That means, there are 4 coliform bacterial colonies in every 100 ml of well water. While 9 sampling points are not eligible. The result is using QMRA got final result that 3 point of sample of water taker indicated low risk, and 7 of them high risk.

Keywords: QMRA, Coliform, dug well water

INTRODUCTION

Water and health is a very related thing. The quality of water consumed can determine the degree of public health. Water wells become a major source of clean water for coastal communities. This is similar to a study conducted on Lae-lae Island, it is known that 58.7% of respondents use unprotected dug wells as a means of clean water for washing and cooking.

Dug wells become the main choice for small islanders because dug wells are easier to obtain than other clean air. However, household income can not be processed and reduced by people who can be a source of bacterial originating from stool. Coliform is an indicator of pathogenic bacteria in airborne microbial contamination. Research showed that 74.5% of households in Bonetambung island do not have latrines and 53.3% of respondents doing bowel movements at sea.

It is a threat to coliform bacteria contamination and will greatly affect the quality of water sources, both marine waters and shallow groundwater. These pathogenic bacteria cause major public health problems caused by contaminated water. A study on Kodingareng Island conducted by Andriyani, showed that of 87 diarrhea sufferers diagnosed by puskesmas, 35 respondents did not have latrines, and the average family members of respondents did bowel movement in the sea (71.4%). In addition, Soller et all reported an increased health risk due to coastal waters affected by runoff containing impurities. Quantitative Microbial Risk Assessment (QMRA) has been widely used in several studies to estimate health impacts associated with water use in coastal areas. The risk of disease / pathogen infection of a bacterium can be calculated using QMRA and can be used in predicting public health risks.
Basically the analysis of Coliform bacteria has been frequently performed in Indonesia, but only using qualitative analysis. The research of bacterial pollution risk by Quantitative Microbial Risk Assessment (QMRA) method is still rare. QMRA has become a rapidly evolving method that systematically incorporates the information available on exposure and dose-response to produce an estimated disease burden associated with pathogen exposure.

Bonetambung Island is one example of a small island located west of Makassar and an island with sea transport access is limited or not available regular transportation to the island. In addition, Bonetambung Island has only one community health center and inadequate environmental sanitation facilities. So we need to do a study on risk assessment related to Coliform bacteria contamination by using QMRA method.

**MATERIALS AND METHOD**

**Study Area**

This research was conducted in Bonetambung Island Makassar City. Location research is based on the 10 biggest diseases, namely diarrhea and is a range of islands Spermonde (Figure 1).

![Figure 1. Research location of Makassar spermonde Islands](image)

exposure assessment to estimate possible infection from contamination of waterborne pathogens. The calculations using QMRA are based on Guidelines for Drinking-water Quality issued by WHO (2008), as follows:

Calculation of Quality Dug Well Water ($C_D$)

To find out the water quality of dug wells is calculated using the following equation:

$$C_D = C_r x (1 - PT)$$

**Note:**

- $C_r$ : quality of raw water (Organism per litre)
- PT : effectiveness of processing

Calculation of Coliform Water Bacteria Exposure

To know the exposure of Coliform bacteria in water (E) used equation as follows:

$$E = C_D x V$$

**Note:**

- $C_D$ : Water quality
- V : The volume of water consumed

Calculation Probability of Infection per Day ($P_{inf,d}$) and Annually ($P_{inf,y}$)

To know the probability of daily infection ($P_{inf,d}$) mentioned by exposure to bacteria through water is as follows:

$$P_{inf} = E x r \text{ or } P_{inf} = 1 - (\alpha)^a$$

**Note:**

- E : exposure to pathogens in mineral water
- r : dose response

Meanwhile, to calculate the probability of an annual infection ($P_{inf,y}$) caused by exposure to bacteria through water consumption is as follows:

$$P_{inf,y} = 1 - (1 - P_{inf,d})^{365}$$

Or if $P_{inf,d} < 1$

$$P_{inf,y} = 365 \times P_{inf,d}$$

**RESULTS AND DISCUSSION**

**Coliform Bacteria Examination**

Based on PERMENKES RI No.416/MEN.KES/PER/IX/1990, one indicator of the quality of well water, the content Coliform bacteria, where the permitted threshold value is 50 colonies / 100 ml. Coliform bacteria is an indicator of other pathogenic microorganisms, especially microorganisms derived from feces.
From the results of research conducted in Bonetambung Island Makassar City obtained the result that from 10 points of water sampling dug well, only 1 point that meet the limits of coliform bacteria contamination, which is 4 MPN. That means, there are 4 coliform bacterial colonies in every 100 ml of well water. While 9 sampling points are not eligible (Graph 1).

Graph 1. Concentration of Coliform Bacteria

The presence of Coliform bacteria in the air allows and introduces enteropathogenic micro that can include health. Possible factors that can lead to positive results and the MPN persuadative test are airborne contamination of the treatment method, particularly in raw air reservoirs, disinfection, and filtration. Other factors affecting production quality are air, type of equipment used, equipment maintenance and water handling17.

Based on the observations made there are several factors that cause the high concentration of Coliform bacteria in the well water in the island are as follows:

a. Well depth

The depth of the well will affect the spread of bacteria vertically. At a depth of 3 meters is estimated to contain bacteria. Therefore, the inner wall lining the water source should be waterproof up to 3 meters18,19. Based on observations made on Bonetambung Island most of the wells have shallow depths. This is a factor that influences the high concentration of Coliform bacteria in the well water

This research is in line with that done by Natsir, that Total Coliform bacteria concentrations on dug wells are higher than wells, this is because the depth of the wells is shallower than that of the well so it is easily penetrated by Coliform bacteria contamination from septic tanks or in river water seeping through the soil pores20.

b. Spacing of Wells with Pollution Source

Spacing of wells with septic tanks is one of the causes of pollution of water sources used for various needs of cleaners and drinking water. According to Susilawaty, the existence of septic tanks on the island is not safe because the distance is too close to the well digging residents. Based on research conducted there are 30 respondents who have septic tank spacing <10 m (Graph 2). This is supported by research conducted by Tendean, there is a meaningful relationship between the distance of wells with pollutant source to the number of Coliform bacteria in Kapitu Village, Amurang Barat District, South Minahasa regency.

Graph 2. Spacing of Wells with Pollution Source

The distance of pollution of the ground by the bacteria horizontally is 11 meters, and vertical is 2 meters. It is important to know to prevent water spills by sewerage or feces. Based on this, it is clear that the closer the septic tank with wells dug, the greater the content of bacteria contained therein21,22.

Assessment of Physical Condition of Dug Well Water

The normal temperature of water in nature (tropical) is about 20°C to 30°C. In addition, the temperature of a body of water is affected by the seasons, latitude (latitude), the height of the sea surface (altitude), time, air circulation, cloud cover, flow, and depth. Temperature changes affect the physical, chemical, and biological processes of water bodies. Island tofografi conditions affect the well water temperature in the island. As according to Tarigan and Edward in Galus (2014), factors that influence the high temperature of water such as altitude factors, the lower the potential where the rainfall potential will receive more, because in general the lower the temperature of a region will be higher23. That is, the more pH or BOD rises, the pH or BOD of the well water will increase24.
In the research, it was found that the average temperature of dug well water in Bonetambung Island was 31.46°C and the average pH was 8.24. In addition, if the bacteria are on the surface of water, then one of the factors that affect the survival of bacteria is salinity. Salinity provides influence on the magnitude of Coliform bacteria concentration in water. The higher the salinity of water the less Coliform bacteria in the water. On Bonetambung Island Makassar City obtained the result that from 10 points of water sampling dug well, only 1 point that meet the limits of coliform bacteria contamination, which is 4 MPN. That means, there are 4 coliform bacterial colonies in every 100 ml of well water. While 9 sampling points are not eligible Bonetambung Island, water salinity is at the value of 0.046.

The development of settlements with all the facilities resulted in the increasing demand for ground water. If that happens, it can cause a decrease in the groundwater surface which leads to salt water into the aquifer in the mainland, so the water wells residents feel brackish or salty. Several studies have shown that temperature, pH, and salinity have a correlation with the proliferation of Colifom bacteria in waters or sources of clean wa/ter. Although there are other environmental factors that also give effect.

**Quantitative Microbial Risk Assessment (QMRA)**

The spread of disease in the era of globalization takes place so quickly that a risk assessment method is needed to overcome the current and future risk of disease. Therefore, a microbial risk assessment (QMRA) is needed as a method to determine the risk of microorganisms.

Based on the result of calculation using QMRA got final result that 3 point of sample of water taker indicated low risk, and 7 of them high risk (Table 1). In categorizing risks, WHO (2008) establishes a risk reference level standard for knowing the danger of pathogenic pollution in water. The risk-level reference level is $10^{-6}$ disability-adjusted life-years (DALY) per person per year, which is equivalent to a cancer lifetime risk of $10^{-5}$ (ie, 1 cancer case per 100 000 water consumers who have ingesting substances over the life span).

<table>
<thead>
<tr>
<th>No</th>
<th>Sample Code</th>
<th>CR</th>
<th>CD</th>
<th>E</th>
<th>$P_{inf,d}$</th>
<th>$P_{inf,y}$</th>
<th>$P_{ill}$</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
<td>2400</td>
<td>24</td>
<td>24</td>
<td>2.39728E-06</td>
<td>0.000875009</td>
<td>1.69516E-05</td>
<td>High Risk</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
<td>2400</td>
<td>24</td>
<td>24</td>
<td>2.39728E-06</td>
<td>0.000875009</td>
<td>1.69516E-05</td>
<td>High Risk</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
<td>120</td>
<td>1.2</td>
<td>1.2</td>
<td>1.19865E-07</td>
<td>4.37508E-05</td>
<td>6.71348E-06</td>
<td>Low Risk</td>
</tr>
<tr>
<td>4</td>
<td>A4</td>
<td>2400</td>
<td>24</td>
<td>24</td>
<td>2.39728E-06</td>
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<td>0.000134269</td>
<td>High Risk</td>
</tr>
<tr>
<td>5</td>
<td>A5</td>
<td>2400</td>
<td>24</td>
<td>24</td>
<td>2.39728E-06</td>
<td>0.000875009</td>
<td>0.000134269</td>
<td>High Risk</td>
</tr>
<tr>
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<td>0.04</td>
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</tr>
<tr>
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<td>A7</td>
<td>2400</td>
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<td>24</td>
<td>2.39728E-06</td>
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<td>0.000134269</td>
<td>High Risk</td>
</tr>
<tr>
<td>8</td>
<td>A8</td>
<td>120</td>
<td>1.2</td>
<td>1.2</td>
<td>1.19865E-07</td>
<td>4.37508E-05</td>
<td>6.71348E-06</td>
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</tr>
<tr>
<td>9</td>
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<tr>
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<td>A10</td>
<td>2400</td>
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<td>2.39728E-06</td>
<td>0.000875009</td>
<td>0.000134269</td>
<td>High Risk</td>
</tr>
</tbody>
</table>

Based on the Drinking Water Guideline WHO (2008), the risk reference level standard is $10^{-6}$. Thus, if the value of $P_{ill}$ or $P_{inf,d}$ is greater than $10^{-6}$ (eg $10^{-5}$) then the risk is high whereas if the value of $P_{ill}$ or $P_{inf,d}$ is smaller than $10^{-6}$ (eg $10^{-7}$) then the risk is low. As for if the value of $P_{ill}$ or $P_{inf,d}$ = $10^{-6}$ then assumed with medium risk.

Dug well water sources that include low risk should still be wary because the level of risk...
may rise to medium risk and even become a high risk. Other factors that can increase the risk of gastrointestinal disease, namely there are still island communities who do not cook water wells before drinking.

CONCLUSION

The concentration of Coliform bacteria on the well water source in Bone Tambung Island exceeds the standard of clean water quality standard. Based on the calculation of Quantitative Microbial Risk Assessment (QMRA), Bonetambung Island as a whole has a high risk of coliform bacteria contamination. This makes the island community must remain vigilant against the use of dug wells.

Conflict of Interest: None

Source of Funding: Directorate Higher Education, Republic of Indonesia

Ethical Clearance: Obtained from University committee

REFERENCES


The Effect of Selenium and Multiple Micronutrient Administration during Preconception Period on the Level of sFlt1/PIGF Ratio to Prevent Preeclampsia at the Molecular Level

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ABSTRACT

Background: The role of Selenium in preventing preeclampsia has been proved in some studies. It is evident that the decrease of Selenium level results in oxidative stress in the placenta, leading to preeclampsia symptoms. This study aims to prove the effect of Selenium on women during the period of preconception to Selenium level and sFlt-1/PlGF ratio in plasma to prevent preeclampsia incidence at the molecular level.

Methodology: The research will use the double blind, randomized, control trial design. The samples are women in preconception period (34 samples in each group). The intervention group will receive Selenium in MMN preparation, while the control group will receive capsules containing ferrum and folic acid (national program). During preconception period, the capsules will be given once a week, while pregnant women will be given the capsules once a day. The levels of selenium will be examined before the treatment. At the 12th and 20th weeks of pregnancy, selenium and Sflt-1, and PlGF were measured. Selenium levels will be measured statistically using the t-test pre-post and paired t-test, while the Sflt-1/PlGF ratio will be determined using a t-test to compare the two groups.

Results: There was no difference between sFlt-1/PlGF ratio in two groups (p=0.23) at the 12th weeks, and (p=0.119) at the 20th weeks. Increasing of sFlt-1/PlGF ratio in IFA group higher then MMN group. Mean of sFlt-1/PlGF ratio under 38 in two groups.

Conclusion: This study discover the efficacy of selenium supplementation in MMN preparations given since preconception time is more effective in reducing the sFlt-1/PlGF ratio at 20 weeks of pregnancy than in group given the Iron Folate supplement and will help to uncover the critical areas of preventing preeclampsia early in molecular level that many researchers were not able to explore. Thus, a new theory on these selenium supplementation in MMN preparations, and possibly other combinations, may be arrived at.

Keywords: Preconception, Selenium, MDA, Sflt-1, Preeclampsia

INTRODUCTION

Until now preeclampsia is still the main cause of mortality and morbidity among mothers and their babies1. In Indonesia, preeclampsia is the second most frequent cause of mother mortality2. Although mother death rate is lower in high-income countries, 16% of mother mortality cases are due to preeclampsia3. The cause of preeclampsia has not been exactly identified, but the underlying causes of incidence are trophoblast invasion and remodeling problems. One of the molecular level...
mechanisms contributing to pathogenic preeclampsia is the Altered Angiogenic Balance\(^4,5\).

Efforts to prevent preeclampsia have been done through intervention using antioxidant micronutrient, because there is an evidence of the involvement of placental oxidase\(^6\). Micronutrient substances are strongly correlated with complications during pregnancy such as preeclampsia. Oxidative stress plays a role in such incidence. In some journals, it is claimed that the intervention is not effective, and there is even a potentiality to be harmful\(^7,8\). Therefore, an intervention is started with the use of Selenium. Selenium is an essential micromineral component of Glutathione peroxidase enzyme. This enzyme, together with superoxide dismutase (SOD) catalyst and vitamin E have a strong antioxidant power to survive oxidative damage by free radicals\(^9\). Selenium is a part of antioxidant enzyme that protects cells and lipid membrane from oxidative damage\(^10\).

The role of Selenium in preventing preeclampsia has been proved in some researches\(^11-13\). It is evident that the decrease of Selenium level results in oxidative stress in the placenta, leading to preeclampsia symptoms\(^14\). The relationship between Se status and preeclampsia incidence is shown in some researches in 45 countries\(^15\). Han in Salles\(^16\) observed that Se supplementation among women in China can prevent hypertension and oedema during pregnancy. The level of Se in serum/plasma and GPx is significantly lower in pregnancy with preeclampsia than in normal\(^17,18\) while low levels of selenoenzym GPx, and thioredoxin reductase are mostly found in preeclampsia than in normal woman\(^17-20\).

The role of selenium intervention in preventing preeclampsia is related to sFlt-1 level. A study by Rayman, M.P\(^21\) shows that at the 12\(^{th}\) and 35\(^{th}\) weeks of pregnancy, selenium concentration increases in pregnant mothers receiving selenium supplement intervention, but decreases in the control group. It is then necessary to conduct a research about the effect of Selenium intervention in (Multiple Micronutrient/MMN) preparation during preconception period on the levels of selenium, malondialdehyde (MDA), sFlt-1, and PIGF to prevent preeclampsia at a molecular level. This research aimed to to assess the effect of giving Multiple Micronutrient supplement containing selenium during the preconception period on the selenium level, malondialdehyde (MDA), and sFlt-1/PIGF ratio in pregnant mothers to prevent preeclampsia at the molecular level.

**MATERIALS AND METHOD**

**Study design and intervention**

Three subdistricts are selected purposively as the representation of Banggai regency area based on some considerations. First, the rate of preeclampsia is high in these three areas. Second, the three locations are accessible, making it possible for monitoring and controlling the intervention. Third, the three subdistricts are similar in terms of the socioeconomic aspect. Finally, people mobility in the three subdistricts is relatively low.

**Sample Size Calculations**

The number of samples is determined with a 90% power to detect 386 differences of sFlt-1 concentration, with type I error in \(\alpha = 0.05\) on one side, standard deviation (SD) 772 (based on the study of Mousavi M\(^22\)). There are 34 preconception mothers in each group with an anticipation value DO 20% and design effect\(^23\).

Based on the calculation above, 34 samples are needed in each group until the end of the observation. Considering that the percentage of newly married women who get pregnant less than six months is 50%, and the median value of time to pregnancy is about six months\(^24\), it is necessary to have samples of 100/50X6=68. The predicted drop out and handling lab error is 20% \((d=0.2)\)\(^25\), so that the number of samples is multiplied with the factor of \(1/(1-d)\). The multiplier factor is \(1/1(1-0.2) = 12.5\), so that the number of samples becomes \(68 \times 1.25 = 85\). Based on the calculation, the study needs to involve 85 samples each group, so that the total number of the samples needed in the recruitment is \(2 \times 85 = 170\) preconceptional mothers.

**Subject Recruitment, Randomization to Treatment**

The samples are eligible respondents based on some inclusion criteria: praconceptional mothers, do not have previous pregnancy, married, aged 18-35 years old, plan to be pregnant in less than one year, and agree to participate in the research by signing an informed consent. The exclusion criteria are preconceptional mothers with hyperglycemia (DM), kidney failure, hypertension, and tuberculosis; not a permanent citizen in the areas (stay duration < 6 months), not living with...
husband, twin pregnancy, obesity (IMT>30), severe anemia (<7g/L), upper arm circumference < 23.5 cm, positive proteinuria (++), six-month participation in the intervention program but not getting pregnant, have been married > 6 years but never get pregnant.

**Pre-pregnancy supplement distribution, measurement of compliance and detection of pregnancy**

The distribution of intervention and control capsules to mothers will be conducted starting from the researcher to subdistrict coordinators, who will then distribute the capsules to village midwives. These village health workers will distribute the capsules among the cadres of integrated service centre in each village. Respondents will be visited once in a week to distribute the MMN capsules as well as to control the adherence in consuming the MMN capsules. During the research, the mothers will not be allowed to consume vitamin and minerals from other sources. Any violation of this requirement will result in the cancellation of respondents’ participation in the study.

**Table 1. The composition of iron folic acid and multiple micronutrient supplements**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Preconception (weekly)</th>
<th>RDA for non-pregnant women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IFA</td>
<td>MMN</td>
</tr>
<tr>
<td>Vitamin A, RE</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Vitamin B12, μg</td>
<td>400</td>
<td>2,6</td>
</tr>
<tr>
<td>Vitamin B6, mg</td>
<td>232</td>
<td>1,9</td>
</tr>
<tr>
<td>Riboflavin (B2), mg</td>
<td>232</td>
<td>1,4</td>
</tr>
<tr>
<td>Vitamin C, mg</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Vitamin D, IU</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Vitamin E, mg</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Zinc, mg</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Iron, mg</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Niacin, mg</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Selenium μg</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Copper, mg</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Folate, μg</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Iodine, μg</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

**Data Collection**

Types and time of data collection can be seen in the following table.

**Table 2. Data collection and measurements**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Preconception</th>
<th>Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12 weeks</td>
</tr>
<tr>
<td>Demographics, SES status</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>OBGYN history</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Environment sanitation</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Exposure to pollutants</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Access to health and nutrition information</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Morbidity</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Pregnancy supplementation, monitoring and follow-up during pregnancy

Pregnant mothers were required to consume one supplement capsule before night sleeping every day. The cadre will distribute the supplements every fortnight, and at the same time, the cadre will monitor the consumption. In addition, the cadre will also record side effects and any pain felt by the mothers. Furthermore, the pregnant mothers will have blood pressure examination, proteinuria assessment, and anthropometric measurement. Their blood samples also taken to determine the levels of hb, glucose, selenium, and MDA at the first stage. At the 12th and 20th weeks of pregnancy, blood sample examination will be conducted to measure selenium level and the ratio of sFlt-1/PIGF at the second stage. The pregnant mothers will also have blood pressure measurement every month, and proteinuria examination at the 20th week of pregnancy. After the samples are taken for examination, the administration of Multiple Micronutrient will be continued until the time close to baby delivery.

Follow-up with women who do not become pregnant

Mothers who do not become pregnant until 6-month administration will be excluded from this study. However, when they quit the research, their Hb level will be examined.

RESULTS

The results of laboratory analysis showed the average value of MMN group of selenium and sFlt-1/PIGF ratio as well as Iron Folate Acid (IFA) group increased at 12 weeks and decreased at 20th week of pregnancy as shown in Figure 1.

In the MMN group, the mean sect ratio of sFlt-1/PIGF at preconception time was 6.0 slightly lower than that of IFA group of 6.5. Furthermore, at 12 weeks of gestation the mean score of sFlt-1/PIGF ratio in the MMN group increased to 58.7, so in the IFA group increased to 48.8. The mean value of the sFlt-1/PIGF ratio was then decreased in both groups at 20th week of pregnancy, to 19.8 in the MMN group, and in the IFA group to 36.1
Figure 1. Comparison of mean values of sFlt-1 / PlGF ratios in preconceptions, week 12 and week 20 in the Folate Iron group and MMN group.

Figure 1 above shows that at week 12 there was an increase of sFlt-1/PlGF ratio in both groups, 52.7 points in MMN group and 42.3 points in Folate Iron group. Furthermore, at week 12 to 20th week of pregnancy, in MMN group there was a decrease of sFlt-1 / PlGF ratio of 38.9 points, and in Folate Iron group there was also a decrease of sFlt-1 / PlGF ratio by 12.7 points.

Thus, a greater decrease in the sFlt-1/PlGF ratio occurred in the MMN group than in the Folate Iron group as it entered the 20th week of pregnancy.

The statistical analysis showed that the mean difference of the mean sFlt-1/PlGF ratio for the two groups at week 12 was 9.9 with p value = 0.49, whereas at week 20, the mean difference was 16.4, p value (0.235). There were no significant differences in either group at week 12 or week 20.

DISCUSSION

The results of study in Figure 1 show that at 12 weeks of gestation an increase in the ratio of sFlt-1/PlGF in both groups was 58.7 μL respectively in the MMN group and 48.8 μL in the Folate Iron group. In both groups there was no significant difference with the value of p = 0.499. Although the mean sFlt-1/PlGF ratio in both groups increased at 12 weeks of gestation, the sFlt-1/PlGF ratio of the results of this study was included in the <38 category which means that there is no possibility of developing preeclampsia\(^2\). This value is also reinforced by De Vivo\(^2\) which revealed that to predict preeclampsia, 38.46 cut-off diagnostic for sFlt-1/PlGF ratio gives 85% sensitivity, specificity and accuracy. Thus the efficacy of selenium supplementation in MMN preparations given since preconception time is more effective in reducing the rate increase of sFlt-1/PlGF ratio at 20 weeks of pregnancy than in the Folate Iron supplement. This study help researcher to uncover critical areas of preventing preeclampsia early in molecular level that many researchers were not able to explore. Thus, a new theory on these selenium supplementation in MMN preparations, and possibly other combinations, may be arrived at.

CONCLUSION

This study discover that the efficacy of selenium supplementation in MMN preparations given since preconception time is more effective in reducing the sFlt-1/PlGF ratio at 20 weeks of pregnancy than in the group given the Folate Iron supplement. This study help researcher to uncover critical areas of preventing preeclampsia early in molecular level that many researchers were not able to explore. Thus, a new theory on these selenium supplementation in MMN preparations, and possibly other combinations, may be arrived at.

Ethical Clearance: Obtained from university committee

Conflict of Interest : None

Source of Funding: PPSDM Scholarship, Kemenkes, Republic of Indonesia

REFERENCES


Technology Application of Water Treatment Using Banana Peel in Eliminating Bacteria in Raw Water at Sudiang, Makassar City

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ABSTRACT

Background: Shortage of drinking water is a big challenge faced by Sudiang Subdistrict particularly in Bakung area in Makassar City. Most of people are living in informal settlements in the area suffer from severe economic stress and poverty. Many of them have low levels of education, lack of good skills, lack of job opportunities and lack of access to clean water services. As a result, water born-diseases such as stomach ache, typhoid, diarrhea, and skin diseases are common and many victims the areas because of poor or the lack of drinking water treatment. The main objective of using this bio-filter method is to assist people in Bakung areas without access to treated water to improve drinking water quality individually.

Materials and Method: Experiments were run to improve design and operating conditions for removing turbidity by Banana peel filtration. This study describe the application media called Banana peel filter as supporting media for treating the drinking water source in Bakung areas urban area.

Results: This experiments revealed that this program effectively reducing the number of bacteria. Regarding the thick of filter system, 75 cm thickness of Banana peel and carbon is the most effective filter that are able to raise the pH from 5.5 to 6-7.5. In addition, the turbidity in banana peel thickness of 65 cm reduce turbidity of 58 NTU become 45 NTU and banana peel with thickness of 75 cm reduce turbidity of 58 NTU to 25 NTU. Furthermore, odor that smelt prior to the treatment in filter system released after filtering due to the decreased of bacteria. Similarly after the treatment no more taste in the water found. Further, some respondents found that no Microbe exist in their water source after the treatment.

Conclusion: By using the banana peel filter as the main media in the water filter system with up low filter system was effective to reduce the number of bacteria, releasing the odor, taste and increase the pH of water.

Keywords: Drinking water, banana peel, up flow methods, water filtration, informal settlement and poor sanitation

INTRODUCTION

Improving the communities’ access to a good water source for life basic needs requires a good and an attained technology that be implemented commonly. The use of banana peel in the water filtering still rare and just has been used for few water treatment in the rural. Other methods have been applied such as the use of porous ceramic filters is promoted globally for household water treatment, but these filters are ineffective in removing viruses from water. Quantity and quality of water is becoming the major requirement for the more populous areas and the advanced levels of community life as a result, the level of water needs of the community increased. In emerging condition, some countries that have advanced the need for water certainly greater than those in normal. Some water sources are limited available, residents Indonesia mostly using water especially surface water streams and water wells. Based on research by the Ministry of Environment (MOE) in 2014 that 70 - 75% of the rivers in Indonesia’s 33 provinces have been polluted.
Including in Bakung area, Sudiang Makassar.

The objective of this experimental was to analyze the quality level of water from dig well located in the Bakung area with parameter smell, taste, pH, and turbidity and bacteria in accordance with the standards Regulations Minister of Health and SNI 4-6. The methods of this was using banana peel as main media, filter and carbon that can also be used with the direction up flow is the direction with additional media such as gravel / crushed stone, quartz/silica and filter mat. In the process the well water poured into the filter tub as the main flow direction from bottom to top. The water coming out of the tub UP Flow bio filter is a process water and piped into clean water tanks.

The cost of water treatment is the main reason for using untreated water for drinking purposes in many urban areas in Sudan. Water borne diseases (diarrhea, typhoid, etc) are common and there are many victims in unimproved urban areas in Khartoum (Sudan) due to poor or the lack of treatment of drinking water. In most rural settlements in Nigeria, access to clean and potable water is a great challenge, resulting in water borne diseases. Adekunle, I., et al.

With an up-flow systems direct the water in the up-flow direction of the system. The water comes into the water system tank and flows through an upper basket and then down a media riser tube in the middle of the tank. Once the water reaches the bottom of the riser tube it is then distributed through a lower basket attached to the riser tube. The water then flows from the bottom of the tank through the filter media in a swirling motion. Secondary treated domestic effluent from single houses have been constructed and instrumented in Ireland in order to investigate whether the technology could provide a solution to the problem of on-site effluent disposal in areas with low permeability subsoils. Another methods applied in Koraro, that use of only improved water sources as a metric for access to water under-represents the situation in Koraro, as many rely on streambeds for water due to the perceived cleanliness and low salinity of this unimproved water source.

To design a slow sand filter Up-Flow, some planning criteria that must be met include: Raw water turbidity less than 10 NTU. If greater than 10 NTU needs to be equipped with a settling basin with or without chemicals. The Speed of screening between 5-10 M3 / M2 / day.

The High-Layer bio filter 70-100 cm. it has Height 25 -30 cm layer of gravel. High water level above the media 90-120 cm. High free space between 25- 40 cm. The number of filters tubs at least two pieces. Water treatment units with slow bio filter is a package. The raw water used the river water or lake water turbidity level is not too high.

**MATERIALS AND METHOD**

This study conducted by applied an experimental method design, during the filtration process, the record and assessment was evaluated to find out effectiveness of the media used for this filtration such as Banana peel, grave, ziolite, active carbon and filter mat affectivity works. In addition this study investigate the effectiveness output of water base on the parameter of pH, taste, odor, and turbidity and bacteriology. Samples were analyzed and observed before and after up flow filtered.

Steps in this research is as follows: a. Testing the water quality of the well water before filtration to obtain preliminary data smell, taste, pH and turbidity and E. coli. Then, Tests carried out at the Laboratory. Testing the density of sand to determine whether the sand meets the requirements as a sand filter. The analyzes were performed to look for size effective and filter media uniformity coefficient. Determining the thickness of the banana peel is 60 cm – 70 cm, this study using three variations of thickness of banana peel and sand filters that is 60 cm, 65 cm and 70 cm. e. Making Water Treatment Equipment filter System Slow in accordance with ISO 3981: 2008.

**RESULTS AND DISCUSSION**

Samples analysis for physical, chemical and microbial parameter both before and after treatment using bio filters were conducted in the accredited Health Laboratory in Makassar, South Sulawesi. All samples were tested by experts with retrieval taken directly from the field in well of Bakung area. Testing was conducted to prove the circumstances water after filtration, which include physical properties turbidity, smell, taste and chemical for pH and Microbiology for E.Coli. this experimental is the second program in order to compare with the prior experimental Banana peel as the main media.

Eligible recommended as clean water should not be passing the maximum reference value and otherwise
water passing through the maximum reference value they do not meet the requirements and standards of water clean. The physical and chemical testing of water in done in the laboratory before filtering and after filtering can be seen in Table 1 as follows:

### Table 1. Parameters results test and the standard from well water sources with 65 cm thickness of Banana peel and active carbon in Bakung Region.

<table>
<thead>
<tr>
<th>No</th>
<th>Parameters</th>
<th>Unit</th>
<th>Test Result Average (Before Treatment)</th>
<th>Test Result Average (After Treatment)</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Turbidity</td>
<td>NTU</td>
<td>55-58</td>
<td>30-45</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Odor</td>
<td>-</td>
<td>Slight odor</td>
<td>No odor</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Temperature</td>
<td>ºc</td>
<td>22 ºc</td>
<td>26 ºc</td>
<td>30 ºc</td>
</tr>
<tr>
<td>4</td>
<td>Taste</td>
<td>-</td>
<td>Little acid</td>
<td>No taste</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>pH</td>
<td>4</td>
<td>6-7</td>
<td>6.8-7.2</td>
</tr>
<tr>
<td>6</td>
<td>Microbial</td>
<td>Colony</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 2. Parameters results test and the standard from well water sources with 75 cm thickness of Banana peel and active carbon in Bakung Region.

<table>
<thead>
<tr>
<th>No</th>
<th>Parameters</th>
<th>Unit</th>
<th>Test Result Average (Before Treatment)</th>
<th>Test Result Average (After Treatment)</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Turbidity</td>
<td>NTU</td>
<td>55-58</td>
<td>20-25</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Odor</td>
<td>-</td>
<td>Slight odor</td>
<td>No odor</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Temperature</td>
<td>ºc</td>
<td>24 ºc</td>
<td>28 ºc</td>
<td>30 ºc</td>
</tr>
<tr>
<td>4</td>
<td>Taste</td>
<td>-</td>
<td>Little acid</td>
<td>No taste</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>pH</td>
<td>5</td>
<td>6-7</td>
<td>6.8-7.2</td>
</tr>
<tr>
<td>6</td>
<td>Microbial</td>
<td>Colony</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From the test results obtained density values for the 65 and 75 cm thickness was ranging between 55-58 to 30-45 and 55-58 to 20-25 NTU respectively, the average value is 35 NTU and this finding revealed that the density is still lower than the standard that of 50 NTU. Odor temperature and taste were tested while survey conducted directly in the field and after filtration through the media available, it was found that before the treatment there was a slight odor and taste, however after the treatment water was odorless and tasteless.

Using the main media of banana peel and active carbon also increase the pH of the water resources both for 65 and 75 thickness after treatment from of 4 to 6.7 and 5 to 7.5 after the treatment completed, respectively. Furthermore, microbial coloni that was found before treatment with 14 in 65 cm thick and 15 in 75 thick was not found any more after treatment. It indicating that the up flow filtering water system was effective using the media of bio filter. Thus, feasible to be applied among communities with limited and or scarce clean water supply.

For microbial removal, Five-year study showed bacterial removal efficiency of 97% on average with a level of fecal coli form of $2 \pm 2$ colony forming units (CFU)/100 mL measured in the treated water. In addition, Study conducted by Schifman, et al., used two tree filters were evaluated: a conventional unit (CTF) with sand/shale mix as filter media, and a modified tree filter.
also effective reduced bacterial in water source\(^{12}\).

The source of pollutant for bacteria have direct effect to the number of contaminant in the water sources. It is in line with study found that effect of distance from pollution sources was more pronounced on fecal and total coliform counts, which decreased with increasing distance from waste dump\(^ {13}\). The use of slow sand filter methods was also conducted in other study and found a contrast result by Elliott, Stauber, DiGiano, de Aceituno, & Sobsey\(^ {12}\) used triplicate columns were loaded with accu sand silica or crushed granite, the Bench-scale experiments provided confirmation that increased schmutzdecke growth, as indicated by decline in filtration rate, is the primary factor causing E. coli reductions of up to 5-log10. However, in fact, filter media type (accu sand silica vs. crushed granite) did not influence reduction of E. coli bacteria.

The qualities of the well water samples were therefore not suitable for human consumption without adequate treatment such as slow up flow filtration system because water from rain may also pollute the ground water through the leaching\(^ {13}\). Continuous monitoring of rainfall, reference evapotranspiration, effluent flows and water level in the sealed systems revealed varying evapotranspiration rates across the different seasons\(^ {14}\).

At the end, it is suggested that an effective strategy application to minimize water consumption and promote sustainable water resources management. Hence, it will be more effective when it is offered to the community and third party to have a partnership regarding this filtration program, which could be the support of basic data and theory for regional water resources planning can be offered completely\(^ {14-16}\). It is also then suggested to local government of Bakung district to promote the sustainable use of simple bio filter technology to keep communities health and safe for the drinking water, this program is simply and easily to be operated and to constructed . Microbial drinking-water quality testing plays an essential role in measures to protect public health from the water born diseases. However, such testing remains a significant challenge where resources are limited among the communities. In addition, it is necessary to monitor water quality parameters by measuring suspended solids, chemical oxygen demand, dissolved oxygen, pH, nitrate-nitrogen, and phosphate concentrations to have more clean water supply\(^ {17-21}\).

**CONCLUSION**

This experimental pre and post analysis of water quality treatment units with main media of banana peel and active carbon obviously have generate an effective methods to supply a clean water in limited or emergency situation where the water source for communities is not meet requirement for health. Base on the laboratory analysis it revealed that all filtrated water much more clean in term of odor, density, taste, pH and colony bacteria.

Conflict of Interest: The authors report that no conflict of interest within this article.

Source of Funding: Research grant of Ministry of Higher Education through Hasanuddin University.

Ethical Clearance: Obtained from University committee

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10. The usual perception of consumers regarding water consumption is that their bills do not match their actual water consumption. Fan, L., et al. 2014


Potential Microbe and Quality of Local Microorganism Solution (Mol) of Banana Hump Based on Concentration and Old Fermentation as Bioactivator of Railing

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ABSTRACT

The purpose of this research is to identify microbial potential and quality of local microorganism solution (MOL) of banana hump based on concentration and fermentation time as composting bio-activator. The research design used was experimental Random Factor Factorial Design (RAK). The results of this study indicated that banana cultivation were Bacillus 3,05 x 10^2, Azospirilum 1,3 x 10^6, Solvent P 2,3 x 10^5 Cellulolytic Microbe as much as 6,65 x 10^5, the highest total bacterial population on the treatment of banana hump 150gram fermentation of 20 days that is 41 x 10^6. The highest degree of acidity was in the treatment of banana hump 250 grams on day 0 that is 5.96. The highest temperature was found in 150 banana hump and 250 gram fermentation 10 days was 29.5 °C. Bio-activator with 150 gram banana cultivation treatment with fermentation length of 0 days produced the highest amount of C / N. Microorganisms from banana cultivators produced the type of microorganisms that varied so that in making the composting bio-activator was better to use the hump to produce levels of N, P, K, C with organic long fermentation of 10 days. To produce a high amount of bacteria is recommended to use banana hump bacillator with 20 days fermentation. For bio-activator with high C / N ratio it is recommended to make bio-activator from banana hump.

Keywords: concentration, length of fermentation, quality of cobbler bioactivity banana hump.

INTRODUCTION

MOL contains microorganisms that can ferment. MOL materials are all around us, easy to find and very cheap if we compare with the cost of buying MOL already in the market. One of the ingredients of MOL is banana hump.1 The wet banana hump contains 43% of calories; 0.6% protein; 11.6% fat; 15% hydrate of charcoal; 60% Ca; 0.5% P; 0.01% Fe; 12% vitamins; and 86% water, while dried banana hump contains 245% calories; 3.4% protein; 66.2% fat; 60% hydrate of charcoal; 150% Ca; 2% P; 0.04% Fe; 4% vitamins; and 20% water.3

Microbones are the ones that used to decompose organic matter, or will act as decomposers of organic material to be composted.12 bioactivator from the snail contain bacteria Pseudomonas flourescens.9 The addition of K elements by utilizing the compost of banana hump is a more economical and environmentally friendly fertilizing technology compared to the addition of inorganic fertilizers.17

Banana hump contain high nutrients with a complete composition, containing carbohydrates (66%), proteins, water, and essential minerals.11 .The banana hump contains microbial decomposers of organic material. The decomposition of the microorganism lies in the outer and inner banana hump.16 The microbial species identified on the MOL of the banana hump include Bacillus sp., Aeromonas sp., And Aspergillus nigger. This is the usual microorganisms decompose organic materials.13 Coconut water is a good medium for the growth of microorganisms during the fermentation process because coconut water contains 7.27% carbohydrate; 0.29% protein; some minerals include 312 mg L-1 potassium; 30 mg L-1 magnesium; 0.1 mg L-1 iron; 37 mg L-1 phosphorus; 24 mg L-1 sulfur; and 183 mg L-1 chlorine.19
The rapid growth and development of banana plants makes the availability of very abundant banana stalks. By using a certain process and the addition of alkaline sulfuric acid, the phosphorus contained in the banana hump can be processed into phosphoric acid. The ingredients that have not been utilized as a source of carbohydrate are banana hump. Banana hump has a composition of 76% starch, 20% water, the rest are proteins and vitamins. Banana hump are rarely used by humans and allowed to decompose naturally. But if used properly, it can be used as decomposer microorganisms. In 100 g of dried cassava, there are 66.2 g of carbohydrates, but it also contains important proteins and minerals.

The microbes present in the bio-activator will help to elaborate complex chemical bonds simple. The difficulty of obtaining fertilizer impacts on the use of expensive chemical fertilizers, so it is necessary to find a way out of reducing dependence on chemical fertilizers.

**MATERIAL AND METHOD**

**Research design**

The research design used was True Experimental. The design of this study using factorial randomized block design (RAK) Factor is first: the concentration of Banana hump, Banana hump 1 (150 gram Banana hump + 100 gr sugar + 1 liter coconut water.), Banana hump 2 (2250 gram Banana weevil + 100 gr sugar + 1 liter coconut water) Second factor is fermentation length consisting of: a. F1 (Fermentation 10 days) b. F2 (fermentation 20 days). Parameters observed are: Biological properties of MOL solution include: total population of bacteria. The chemical properties of the MOL solution include the pH, N, P, K, C, C / Physical properties of the MOL solution including odor and MOL color. Data Analysis: the observed data were analyzed by using variance analysis using randomized block design of factorial pattern. If the treatment showed a real effect, then it was followed by BNT test of 5% level.

**RESEARCH RESULTS**

**Isolation Bacteria from bio-activators Banana hump**

Isolation of bacteria obtained from this research comes from bio-activator Banana hump and Observation Morphology Bacteria colonies obtained from this research derived Bio-activator banana cobs obtained Lactobacillus sp. as much as 3.05 x 102, Saccharomyces. as much as 3.4 x 105, photosynthetic bacteria. as much as 5.4 x 104, Aktinomisetes sp. as many as 1.46 x 105 bacterial isolates from bio-activators Banana hump capable of growing on the media.

Photosynthetic bacteria form beneficial substances that produce amino acids, nucleic acids and bioactive substances derived from harmful gases and serve to bind nitrogen from the air.

**Figure 1. Bacterial Actinomycetes sp on banana hump**

Banana hump contains microbial decomposers organic material. Microbial decomposers are located on the outer and inner Banana hump. The microbial species identified in MOL banana hump include Bacillus sp., Aeromonas sp., And Aspergillus nigger. It is this microbial that usually describes organic matter. Microbes on MOL Banana hump will act as decomposers of organic materials to be composted.

The high carbohydrate content in the banana stalk allows it to be fermented to produce vinegar. In the process of fermentation, carbohydrates will be converted into sugars by S. cerevisiae, the sugar is converted to alcohol and the alcohol is converted by A. aceti to acetic acid. In addition to the potential in fermentation is also potential as a bio-activator in composting.

**Total Population of Bacteria**

The result of research based on statistical analysis showed the interaction of Banana hump concentration, and fermentation time had no significant effect on total population parameter of bacteria, MOL solution. The single factor of concentration, the Banana hump, had no significant effect on all parameters. Single factor of fermentation, Banana hump, no significant effect on all
parameters.

Table 1. Results of sample examination Concentrations, Banana hump, and Length of Fermentation,

<table>
<thead>
<tr>
<th>No</th>
<th>TYPES OF SAMPLES</th>
<th>DAYS TO</th>
<th>Number of Bacteria days to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PH TEMPERATURE</td>
<td>PH TEMPERATURE</td>
</tr>
<tr>
<td>1</td>
<td>Banana hump 150</td>
<td>10 days</td>
<td>4.22</td>
</tr>
<tr>
<td></td>
<td>gram 20</td>
<td>20 days</td>
<td>5.96</td>
</tr>
<tr>
<td>3</td>
<td>Banana hump 150</td>
<td>10 days</td>
<td>4.23</td>
</tr>
<tr>
<td></td>
<td>gram 20</td>
<td>20 days</td>
<td>5.05</td>
</tr>
</tbody>
</table>

Seen in the results of research showed the highest result of total population of bacteria found in treatment Banana hump 150gram fermentation 20 days that is 41 x 10^6 Research results total population of bacteria MOL solution, humps increased in the fermentation, the longer the total population fermentation of bacteria growing. The main source in the manufacture of MOL solution is carbohydrates, glucose, and the source of the microorganism itself. Carbohydrate sources in this study are banana hump, glucose from brown sugar and the source of microorganisms derived from cow urine.19

**Temperature**

The results showed that the highest temperature was in the treatment of 150 bananas and 250 grams of fermentation of 10 days i.e. 29.5 0C. The duration of fermentation was real (P <0.05) against MOL temperature. BNT0.05 test result, the highest temperature was obtained at 10 days old fermentation stage, which in general was significantly different with other level. The heat produced by the fermentation process is related to the growth curve of microorganisms.2

**pH of MOL solution**

These results indicate that pH is elevated both in terms of values and elevated status from somewhat alkalis to alkalis. This suggests that microorganisms are very active in decomposing organic matter. Increased pH of bio-activators is due to the decomposition process of releasing carbonate ions and OH-ions, thus increasing the alkalinity of the bio=activator Iontcarbonate is able to attract the OH-ions and when reacting with H2O produces OH-ions so as to attract Al3 + ions from the smelting complex, H2CO3 is formed weak and precipitated Al (OH) 3 which resulted in pH bio-activators increased.6,7 High carbohydrate content in Banana hump, allowing to be fermented to produce vinegar. In the process of fermentation, carbohydrates will be converted into sugars by S. cerevisiae, the sugar is converted to alcohol and the alcohol is converted by A. aceti to acetic acid. In addition to the potential in fermentation is also potential as a bioactivator in composting.

**Color**

The results showed that bio-activator with Banana hump treatment 150 gram with fermentation length of 10 days and 20 days and 250 gram banana ginger with fermentation length of 10 days and 20 days resulted in striking color change. The results of statistical analysis can be concluded that: there is a difference between treatments.
**Smell**

The results showed that bio-activators from Banana hump with concentration 150 gram and 250 gram on day 0 showed bio-activator was odorless while at concentration 150 and 250 gram with fermentation time 10 and 20 day yield odor. Statistic result can be concluded: there is difference between treatment total population of bacteria found in treatment of Banana hump 150 gram fermentation 20 days that is 41 x. The highest degree of acidity found in the treatment of Banana hump 250 grams on day 0 that is 5.96. The highest temperature is in the treatment of 150 and 250 grams of bananas fermentation 10 days ie 29.5°C.

**Corganic, N, C / N.Number of Organic Ingredients P.K**

<table>
<thead>
<tr>
<th>TYPES OF SAMPLES</th>
<th>10 days</th>
<th>20 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBP150gram</td>
<td>3.09 ± 0.001b</td>
<td>4.15 ± 0.0008a</td>
</tr>
<tr>
<td>CBP250gram</td>
<td>5.12 ± 0.0008d</td>
<td>4.68 ± 0.002c</td>
</tr>
<tr>
<td>NBP150gram</td>
<td>0.016 ± 0.001c</td>
<td>0.018 ± 0.001c</td>
</tr>
<tr>
<td>NBP250 gram</td>
<td>0.015 ± 0.001c</td>
<td>0.023 ± 0.0008b</td>
</tr>
<tr>
<td>C/NBP150gram</td>
<td>187.25 ± 14.61e</td>
<td>223.75 ± 16.58d</td>
</tr>
<tr>
<td>C/NBP250gram</td>
<td>340.75 ± 35.25e</td>
<td>205.75 ± 4.27d</td>
</tr>
<tr>
<td>The amount of organic matter BP150gram</td>
<td>5.34 ± 0.0008n</td>
<td>7.17 ± 0.0008i</td>
</tr>
<tr>
<td>The amount of organic matter BP250 gram</td>
<td>8.82 ± 0.05s</td>
<td>8.09 ± 0.00099</td>
</tr>
<tr>
<td>P BP150 gram</td>
<td>0.011 ± 0.0009a</td>
<td>0.024 ± 0.04c</td>
</tr>
<tr>
<td>P BP250 gram</td>
<td>0.014 ± 0.0008a</td>
<td>0.012 ± 0.001c</td>
</tr>
<tr>
<td>K BP150 gram</td>
<td>0.334 ± 0.1b</td>
<td>0.237 ± 0.002a</td>
</tr>
<tr>
<td>K BP250 gram</td>
<td>0.243 ± 0.001d</td>
<td>0.25 ± 0.03c</td>
</tr>
</tbody>
</table>

The fermentation process on the quality of the MOL solution did not go well The results of C-organic content on two week fermentation and four weeks fermentation increased, C-organic decreased at week six. The correlation test showed an unstable positive effect between C-organic and N- total with $r = 0.17$.\(^{19}\)

**C / N**

The high C / N ratio in the treatment of 250 grams of Banana hump with 10-day fermentation was due to the low N-total treatment, while the 250-gram banana flavor treatment with 20-day fermentation had a high N-total content. The higher the N-total there will be a decrease in Ratio.\(^{19}\)

**Nitrogen**

However, with the activity of decomposition by microorganisms then the organic complex can be converted into a simple organic that eventually produces potassium elements that can be absorbed by plants. Basically, Potassium plays an important role in the photosynthesis of protein and cellulose formation, in addition to strengthening plant stems which also means to enhance plant resistance. Sutari et al showed the analysis of N-total content decreased at four weeks fermentation, but again increased in the fermentation of six weeks. The low N-Total in each treatment is due to the effect of the process occurring in the visible nitrogen cycle.\(^{19}\)

N-level bio-activators of banana gums may increase and decrease depending on whether or not complete the reaction that occurs in cycle N in the process of decomposition.\(^7\)

**Phosphor**

The results showed that P content increased in Banana hump treatment 150 gram fermentation length of 10 days compared to 20 days and there was a decrease
in the treatment of Banana hump 250 gram fermentation duration 10 days compared to 20 days. This is consistent with the research of Kesumaningwati who said that the Banana hump increase the total P2O5 content compared to the use of EM4 as decomposer TKKS.\footnote{Kesumaningwati, R. Utilizing of Banana’s Corm (Musa paradisiaca) Microorganisms As Oil Palm Empty Fruit Bunches Decomposer. Ziraa’ah, 2015; 40(2), 40–45.}

The linkage of P-content available with pH positive effect is not real seen from correlation test result which shows r value = 0.79 which means as much as 0.79% P-available content is affected by pH. The higher the pH the more available P-content will be increased.\footnote{Indasah*, Yuly Peristiowati*, N. The Effects of Concentration and Fermentation Time on Quality of Local Microorganism Solutions (LMS) of Stale Rice, Cassava “Tape”, Banana Bumps and Cow’s Rumen or Rotten Fruits. Health Notions, 2017; 1(1), 1–5.}

**Potassium**

The results showed that the K content decreased on the treatment of 150 gram bananas 150 days old fermentation compared to 20 days and fixed on Banana hump treatment 250 gram fermentation length 10 days compared to 20 days.

**CONCLUSION**

Microorganisms from Banana hump i.e. Bacillus as much as 3.05 x 102, Azospirilum 1.3 x 106, P Solvent 2.3 x 105 Cellulolytic Microbe as much as 6.65 x 105. The results showed the highest results of total population of bacteria found in the treatment of Banana hump 150 gram fermentation 20 days that is 41 x 106. The results showed that the highest temperature was in the treatment of stale rice 150 gram fermentation 10 days, 150 Banana hump and 250 gram fermentation 10 days that is 29.5°C. The highest degree of occultism is found in the treatment of Banana hump 250 grams on day 0 that is 5.96. Bio-activator with 150 gram banana cocktail treatment with fermentation length of 0 days yields the highest amount of C / N. Microorganisms from Banana hump produce variant microorganisms so that in making composting bio-activator better use the cobs To produce levels of N, P, K, C organic with fermentation duration of 10 days.

**Conflict of Interest:** None

**Source of Funding:** From Kemenristek Dikti 2017

**Ethical Clearance:** Taken from University Committee

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This paper presents the overall review of Basics of PMBLDC Drive System, Converter Topologies, Fuzzy Logic Controlled PMBLDC Drive System for BLDC motor drives. BLDC motors are widely used for household applications due to its features of high reliability, simple frame, high efficiency, fast dynamic response, compact size and low maintenance, etc. The switches are electronically commutated based on the information of rotor position detection. The position of the rotor is determined with the help of the sensor or sensorless techniques. Hence it is an electronically commutated motor.

**Keywords:** Basics of PMBLDC Drive System, Converter Topologies, Fuzzy Logic Controlled PMBLDC Drive System

**INTRODUCTION**

The proposed controller is based on Adaptive Neuro-Fuzzy Inference System (ANFIS) and the rigorous analysis through simulation is performed using Simulink tool box in MATLAB environment. The performance of the motor with proposed ANFIS controller is analysed and compared with classical Proportional Integral (PI) controller, Fuzzy Tuned PID controller and Fuzzy Variable Structure controller. The dynamic characteristics of the brushless DC motor is observed and analysed using the developed MATLAB/ Simulink model. Control system response parameters such as overshoot, undershoot, rise time, recovery time and steady state error are measured and compared for the above controllers. In order to validate the performance of the proposed controller under realistic working environment, simulation result has been obtained and analysed for varying load and varying set speed conditions.

**Survey on Basics of PMBLDC Drive System**

Based on the insightful investigations of the BLDC gadget geometry, diverse reduced components converter have been proposed by way of Hong J P, et al [1] for the 2 segment BLDC motor. Further the four switch 3 section BLDC motor drives, the reduced parts converters for two phase and multi-phase BLDC cars also are mentioned and comprehensive evaluation is used to design successfully low price pressure applications, consisting of electric drives and gas cells.

A novel sensor much less commutation technique primarily based on the average line to line voltage is proposed by means of Cheng-Hu Chen, et al [2], which gets rid of the motor neutral voltage. The impartial voltage isn’t required in the given approach. A novel FPGA based totally measuring device less control scheme for four-switch three-segment brushless dc motor force the usage of asymmetric PWM scheme and six commutation modes in FSTP inverter is proposed through Cheng-Tsung Lin, et al [3]. The function facts is estimated from the crossings of voltage waveforms in floating levels, and a low price FPGA is applied to enforce the set of rules. Because the stator present day waveforms of the FSTP inverter using this novel voltage PWM scheme are rectangular, the motor will operate easily and the torque ripple could be at the equal degree as pronounced. However, the two anticipated commutations may motive commutation torque ripple. A soft computing technique PSIM is used for the performance simulation of the BLDC motor. With the assist of its user pleasant approach and a few primary theories, the corresponding PSIM fashions for the BLDC can without problems be built.
A new startup and smooth switching approach of a sensorless brushless DC motor is analysed. By the usage of this approach, the rotor function at standstill may be expected with a resolution of 60° and the motor is extended to a positive velocity at which the lower back-EMF detection technique may be implemented.

According to [4] electric drive system with BLDC motor has higher dynamic responses. It is determined that BLDC motor is the great desire for excessive performance motor. The control device for BLDC motor is designed and simulated the usage of MATLAB/Simulink.

Chun, et al [6] develops the brushless dc (BLDC) motor sensorless control device for car fuel pump. The sensorless techniques which might be based totally on a hysteresis comparator and a capability begin-up approach with a high starting torque are cautioned. The hysteresis comparator is used to atone for the segment delay of the back EMFs due to a low-skip clear out (LPF) and additionally prevent more than one output transitions from noise or ripple in the terminal voltages.

At beginning circumstance, if the motor is commenced with consistent DC supply, the cutting-edge is just too excessive because of the absence of lower back EMF[5].

Survey on Various Converter Topologies

Lee B K., et al [8] have given an overview of decreased elements converter topologies and manipulate strategies for power correction and they have reviewed and evolved a motor manipulate systematic design method. The specific operational concepts are tested and the overall performance contrast is mentioned with all the merits and demerits. By following this numerous low price energy converters are advanced.

DSP primarily based manage schemes for motor force packages. They additionally discuss approximately the circuit design and manage algorithm improvement of a pulse width modulation (PWM) voltage source inverter (VSI) for three section brushless DC (BLDC) motor control programs[7].

A low fee BLDC motor drive using greenback-raise converter for residential and industrial programs, has been proposed with the aid [9]. Here a unique low cost, noticeably efficient, reliable and compact motor pressure topology for PMBLDC Motor is provided.

A low fee role sensorless manipulate schemes for brushless dc cars is proposed with the aid [10]. The rotor function statistics is extracted via in a roundabout way sensing the lower back EMF from handiest one of the three motor terminal voltages for a three phase motor. Depending on the terminal voltage sensing locations, both a low bypass filter out and a band skip filter out is used for function records retrieval. Thus fee saving is similarly extended by coupling the sensing circuit with a unmarried chip microprocessor or digital signal processor for velocity manage. It extends the working velocity range and improves motor efficiency. A transformer primarily based resonant dc link inverter for BDCM drive machine, able to controlling 0 voltage notch on the spot and width is presented[11]. All switches paintings underneath soft switching situation, so their energy loss is small and voltage strain throughout all switches might not be greater than dc supply voltage. A new robust controller scheme for PMBLDC motor force is proposed [12]. The scheme complements the robustness for the load versions aside from making sure accurate overall performance in nominal situations. It is because of the decoupling of velocity and contemporary control loops and the potential to make outer speed loop balance unbiased of the possible parameter versions, which influences the inner loops. Most critical feature of the proposed velocity control scheme is that the outer velocity controller is intrinsically loose from windup and saturation of the internal loop, which substantially simplifies the overall manage sequence. A DC-DC converter with coupled inductor is proposed [13], which achieves loss-less switching for each the principle and auxiliary switches without increasing the principle device modern-day/voltage score. A tapping inside the pole inductor is added for commutation. This technique of generation of the auxiliary voltage is needed to reset the ZVS circuit. A low price 4 transfer brushless dc motor pressure for business application is developed [14], that’s targeting direct cutting-edge managed PWM scheme. The feasibility of four switch converter is prolonged to two-segment BLDC motor pressure and the six switch converter for strength aspect correction and velocity control. A non-iterative controller layout for a BLDC Drive System that specializes in 0.33 order manage systems inclusive of BLDC motor force systems with complicated open loop poles is proposed with the aid [15]. The compensated system this is designed the usage
of this method should yield preferred specifications with greater accuracy for exclusive BLDC drive structures. A simple mathematical model of brushless DC motor is developed and PID control based on the Ziegler-Nichols method is supplied and applied to brushless DC motor. This technique is feasible due to the precise and simplified structure of this motor. The PID controller designed has been simulated and located to have precise overall performance, where the results display that the overshoot earlier than including the PI manage become 71% however after including PI manage the maximum overshoot became about 0 which is a great end result. The pace manipulate of brushless dc motor drive employing PWM method the use of TMS320F240 virtual sign processor is advanced. BLDC is broadly used for due to its high mechanical energy density, simplicity and value effectiveness. The controller has were given unique features for virtual motor control. A fault tolerant (FT) torque controller for brushless dc (BLDC) cars that could hold correct torque production with minimal energy dissipation, although one of its phase fails has been proposed. The awesome function of the FT controller is that it’s far applicable to BLDC vehicles with any back-electromotive-force waveform. Faulty phases are detected from the covariance of the estimation error. Subsequently, the segment currents of the last levels are optimally reshaped. Consequently, the motor appropriately generates torque as requested while minimizing the energy loss situation to most cutting-edge problem of the modern amplifiers.

Il-oun lee, et al. have proposed an interleaved buck converter (IBC) that has low switching losses and improved step down conversion ratio, which is also appropriate for the utility wherein the input voltage is excessive and the working responsibility cycle is underneath 50%. Optimization of PM Brushless DC motor drive is analyzed, deciding on a reference version for desired drive behaviour generation. Optimization strategies had been implemented to reap controller necessary time steady that’s lower than the maximum time steady of the PM brushless DC motor drive. Simulation consequences show that by way of the usage of reference model for favored pressure behaviour generation, it’s far possible to decide top of the line controller parameters for quicker (10 time) and higher (2 time) load torque repayment than in the case of traditional design of pace controller parameters. A new IBC is proposed ,which has desirable traits, more easy in structure.

Survey on Fuzzy Logic Controlled PMBLDC Drive System

Speed law in a small brushless dc motor (BLDC) with trapezoidal returned emf has been considered, in which the proposed manipulate approach makes use of the proportional controller wherein the proportional benefit, Kp is as it should be adjusted via using genetic algorithm. As a end result the speed may be regulated to perform within a ± 5% pace error band.

Fuzzy good judgment controller for brushless direct modern-day (BLDC) permanent magnet motor drives has been proposed. A fuzzy logic controller is developed the use of MATLAB Fuzzy-Logic Toolbox after which inserted into the simulink version. Fuzzy Logic Controlling of Brushless DC motor with fast control prototyping approach. A simulink model of brushless dc motor is installed and a fuzzy controller which controls the voltage and cutting-edge is inserted on this version, that’s without delay communicated to the DSP tool.

PMBLDC drives the use of meaningful fuzzy units and regulations. The fuzzy good judgment controller is evolved the usage of a MATLAB/ Simulink tool.

The conventional PID controller and Hybrid Fuzzy-PID controller performances are analysed each in steady state and dynamic operating circumstance with various set point speeds. The rise time, lifeless time, settling time and consistent country error are the parameters taken into consideration for comparison.

CONCLUSION

In this paper, an attempt has been made to review various literatures for the classical controller techniques introduced by the different researchers for tuning of different controller for speed control of DC motor to optimize the best result. This review article is also presenting the current status of tuning of ANFIS controller for speed control of DC motor using classical controller techniques.

Ethical Clearance- Done by own Interest and with research committee

Source of Funding- Self

Conflict of Interest- Nil
REFERENCES


A New Optimization Technique for Minimization of Power Loss

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ABSTRACT

Optimal power flow could be a mathematical model that represents a physical power grid optimization drawback. It is a challenging task developed as an extremely strained non-linear program whose resolution states the best in operation condition of the system. This operation purpose should satisfy the full power demand and limit constraints whereas minimizing a value operate. This paper presents a changed Flower impregnation algorithmic rule (MFPA) to point out the benefits of projected algorithmic rule a comparative study with alternative meta-heuristic optimization techniques is applied. The numerical results clearly show that the improved algorithm provides higher results than Cuckoo-search and customary flower impregnation (FPA) algorithms in terms of fuel value worth and time needed to achieve international best resolution. In order for instance the effectiveness of the projected algorithmic rule, it has been checked on a changed IEEE 30-bus test system.

Keywords—Flower impregnation algorithmic rule (MFPA), meta-heuristic, cuckoo-search, Customer flower impregnation (FPA)

INTRODUCTION

The total capability of power plants ought to be bigger than the entire electrical load demand in order that the electricity provide may be adequate. The entire put in Capability of power plants in state reaches forty,265.62 MW27,867.88 MW (69.21%)of that square measure situated within the Java Island. Once classified by the kids of units, turbine and combined cycle have the most important proportion with fifty-three .90% and 28.3 % severally. Hydro plants structure to eight .63%, Whereas turbine seven.10%, energy one .24% and diesel zero 8.80% [1,2]. Thermal composition of put in power plants in Java Island. Thermal power plants square measure the ability plants that convert energy from fuel combustion to induce the energy wont to drive the rotary engine then generates electricity [3,4]. This causes fuel to be associate degree integral part of thermal power plants.

Flower Fertilization algorithm rule is associate algorithm rule developed [11]. FPA may be a met heuristic algorithm rule galvanized by natural phenomenon associated with flower fertilization method. Fertilization will be perfect into four rules [5,6].

- Organic phenomenon and cross-pollination is taken into account as international fertilization method with pollen-carrying pollinator’s activity levy flight.
- Improvement voltage stability and improvement of security for power transmission between two areas. These objective functions mathematical models are given below minimize.
- Flower constancy will be thought of because the replica chance is proportional to the similarity of 2 flowers concerned
- Native and international fertilization are unit controlled with the chance switch p ∈ no wing to a physical approach and alternative factors like wind, native fertilization will have a major probability (p) in overall activity of fertilization. Two key steps during this algorithm rule unit international fertilization and native fertilization. At the world fertilization step, spare
is carried by pollinators and may give long distances [7,8]. This ensures the foremost optimum fertilization and replica (best fitness) of the fitness worth is depicted as $g^*$.

$$P_L =$$  \hspace{1cm} (1)  

**PROBLEM FORMULATION**

OPF is power system optimization problem and has objective function need to be optimized which is subjected to constrains.

There are two types of constrains namely equality and inequality constrains [9,10]. This complex, on linear OPF problem has multi objectives of minimization of fuel cost or generation cost, minimization of emission, minimization of loss and improvement voltage stability and improvement of security for power transmission between two areas. These objective functions mathematical models are given below Minimize $F_i(P_g)$

$$F_i(P_g) =$$  \hspace{1cm} (2)

Where $F_i$ is minimization of fuel cost $x, y, z$ and $z_i$ are quadratic coefficient of fuel cost

**Equality Constraints**

The Power balance equation for the test system is given by

$$P_{gi}, P_{dj}, P_{lk}$$  \hspace{1cm} (3)

Where $P_{gi}$, $P_{dj}$, $P_{lk}$ are real power generation, real power demand and real power loss, and $Q_{gi}$, $Q_{dj}$, $Q_{lk}$ are reactive power generation, reactive power demand and reactive power loss are represented Transmission losses calculated using B-coefficient method are represented by

**Inequality Constrains:**

Active Power Constraint: The active power generation limits for the thermal generators are given by

$$P_{pgi}, P_{pgj}, P_{pgk}$$  \hspace{1cm} (4)

Where $P_{pgi}$ are minimum and maximum active power of the $i^{th}$ generating unit

Generator constraints

Real and reactive power generation bounded between minimum and maximum limit, and similarly control variable of generator bus voltage

$$P_{l} =$$  \hspace{1cm} (1)  

**RESULT AND DISCUSSION**

This research was conducted with FPA parameters in which the probability switch value is set at 0.8, population size 20 and number of iterations of 6,000, with tolerance of 0.001. The results are shown in Table II. From these results, note that the value of control variables is still in the normal range.

The voltage magnitude on all buses after optimization is in the range of 0.95 p. u - 1.1 p.u. The lowest voltage value is 0.984 p. u on bus 19, while the highest voltage of 1.05 p. u are on buses 1, 17, 21, and 25. However, the value is still within the allowable range. Comparison of voltage between before and after optimization using FPA is shown in Fig. 3.

In addition to voltage constraints, line current is also a constraint that should not be violated.

**Table 1 Generator cost coefficient and Active power limits of IEEE 30 bus system**

<table>
<thead>
<tr>
<th>Unit</th>
<th>$P_{pgmin}$</th>
<th>$P_{pgmax}$</th>
<th>$A_{i}$</th>
<th>$B_{i}$ ($$/MW$$)</th>
<th>$C_{i}$ ($$/WM^2$$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>200</td>
<td>0</td>
<td>2.00</td>
<td>0.00374</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>80</td>
<td>0</td>
<td>1.69</td>
<td>0.0173</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>50</td>
<td>0</td>
<td>0.99</td>
<td>0.0624</td>
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<td>4</td>
<td>10</td>
<td>55</td>
<td>0</td>
<td>3.15</td>
<td>0.00833</td>
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<tr>
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<td>10</td>
<td>30</td>
<td>0</td>
<td>2.95</td>
<td>0.023</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>40</td>
<td>0</td>
<td>2.95</td>
<td>0.024</td>
</tr>
</tbody>
</table>

The proposed method is tested on IEEE 30 bus system and the results are compared. The cost coefficients of the thermal generators and limits on power generation of the system are given in Table 1. The best solutions obtained for cost minimization objective are given in Table 2.
Table 2: Optimal Power flow analysis for IEEE 30 bus system

<table>
<thead>
<tr>
<th>BusNo</th>
<th>VM</th>
<th>VA</th>
<th>Pg(MW)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.05</td>
<td>0</td>
<td>176.23</td>
<td>468.92</td>
</tr>
<tr>
<td>2</td>
<td>1.032</td>
<td>-0.033</td>
<td>48.792</td>
<td>127.05</td>
</tr>
<tr>
<td>5</td>
<td>1.01</td>
<td>-0.168</td>
<td>21.405</td>
<td>50.042</td>
</tr>
<tr>
<td>8</td>
<td>1.02</td>
<td>-0.146</td>
<td>21.2</td>
<td>73.368</td>
</tr>
<tr>
<td>11</td>
<td>1.061</td>
<td>-0.152</td>
<td>12.010</td>
<td>39.642</td>
</tr>
<tr>
<td>13</td>
<td>1.050</td>
<td>-0.186</td>
<td>12.000</td>
<td>39.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Cost</td>
<td>8.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Time/ Iteration</td>
<td>0.118s</td>
</tr>
</tbody>
</table>

From the table it is inferred that the FPA took a very less computation time for producing an optimal cost of 798.6421 $/hr. The power loss (PL) obtained for the case is 8.44MW. The voltages(VM) and angles (VA) at the generator buses are in the desired limits. The cost and dispatch obtained with FPA method are compared with methods like RGA[6], MDE[7], TS[8], EGA[9], PSO[10], EADDE[11], ARCBBO[12]. It is observed that the FPA method gives a minimum cost and also simultaneous reduction in loss compared to the others methods. The values are given in Table3. The figure representing cost minimization is shown in Fig 1. From the figure it can be inferred that cost obtained by FPA optimization is very less compared to other methods.

Table 3: Comparison of dispatch obtained for IEEE 30 bus system using FPA

<table>
<thead>
<tr>
<th>Method</th>
<th>G1 (MW)</th>
<th>G2 (MW)</th>
<th>G3 (MW)</th>
<th>G4 (MW)</th>
<th>G5 (MW)</th>
<th>G6 (MW)</th>
<th>PG (MW)</th>
<th>PL (MW)</th>
<th>COST ($/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGA[6]</td>
<td>174.02</td>
<td>46.7</td>
<td>22.00</td>
<td>23.8</td>
<td>11.00</td>
<td>14.4</td>
<td>292.22</td>
<td>8.82</td>
<td>804.01</td>
</tr>
<tr>
<td>TS[8]</td>
<td>176.02</td>
<td>48.74</td>
<td>21.55</td>
<td>22.04</td>
<td>12.42</td>
<td>12.00</td>
<td>292.84</td>
<td>9.44</td>
<td>802.27</td>
</tr>
</tbody>
</table>

A comparison of minimum cost, average cost and maximum cost obtained using various methods is shown in Table 4. The FPA algorithm is run for 50 trails and the observations were made.

It is observed from the table that FPA gives these result in short computational time. The improved voltage profile using FPA compared to PSO and convectional load flow is shown in Fig 2. It is observed that the voltages at the buses are in desirable limits with the FPA.

Table 4 Comparison of results for minimum cost

<table>
<thead>
<tr>
<th>Method</th>
<th>Min cost ($/hr)</th>
<th>Avg.cost ($/hr)</th>
<th>Max Cost ($/hr)</th>
<th>Time (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGA[9]</td>
<td>802.058</td>
<td>NR*</td>
<td>802.12</td>
<td>75</td>
</tr>
</tbody>
</table>

Fig 1. Cost comparison with various optimization techniques
CONCLUSIONS

In this paper, the MFPA has been successfully implemented to solve OPF problem. The proposed algorithm has been tested on the IEEE 30-bus system. Four functions were optimized to evaluate its performance. The multiple evaluations shown competitive results compared against other meta-heuristics algorithms. The main advantage of the MFPA is to find fitter initial solutions and improve the switching process. Both modifications let the algorithm reach the convergence using less iteration with a reduced time of processing. Another key advantage of this algorithm is the easy incorporation of different type of objective functions: continuous and non-smooth, and easily handling of nonlinear constraints. These characteristics make easy the extension of this algorithm to be applied for multi-objective optimization problems.

Ethical Clearance- Done by own Interest and with research committee

Source of Funding- Self

Conflict of Interest - Nil

REFERENCES


A Novel Optimization Technique for Optimal Reactive Power Flow

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ABSTRACT

Financial load dispatch (ELD) is that the principle change undertaking in office task. Limiting the fuel cost by ideally setting the $64000 control yields from generators is that the goal of ELD drawback. In this work, ELD drawback is self-tended to by considering 3 entirely unexpected value capacities. Genuine power ages ar balanced for limiting the fuel cost by exploitation bloom impregnation manage (FOA). In this paper, a substitution and intense equation known as Flower fecundation recipe (FPA) is anticipated for best assignments and filler of capacitors in differed conveyance frameworks. Introductory the first competitor transports for putting in capacitors square measure asked abuse Power Loss Index (PLI). At that point the anticipated FPA is used to find the size of capacitors and their areas from the elective transports. the objective perform is expected to reduce the general cost and thus to broaden net sparing yearly. The anticipated equation is tried on fifteen, sixty nine and 118-transport spiral conveyance frameworks.

The acquired outcomes by means of the anticipated recipe square measure contrasted and elective calculations like Genetic equation (GA), Particle Swarm change (PSO), Plant Growth Simulation recipe (PGSA), Direct Search equation (DSA), Teaching Learning-Based change (TLBO), Cuckoo Search equation (CSA), Artificial Bee Colony (ABC) and Harmony Search recipe (HSA) to center around the benefits of the anticipated recipe. In addition, the outcomes square measure acquainted with check the adequacy of the encouraged equation to decrease the misfortunes and aggregate cost and to fortify the voltage profile and web putting something aside for shifted circulation frameworks.

Keywords: Flower pollination, algorithm Power systems, optimal capacitor locations, Power loss index, Distribution systems.

INTRODUCTION

The raised demand for power and therefore the meagerly power generation and transmission facility forces the facility system networks is being operated underneath stressed conditions. The protection of an influence system is underneath threat once it’s operated at stressed conditions and should lead to voltage instability. These days voltage instability has become a brand new challenge to installation designing and operation. Meagerly reactive power accessibility or non-optimized reactive power flow could lead an influence system to insecure operation underneath heavily loaded conditions. By reallocating reactive power generations within the system by adjusting electrical device faucets, generator voltages and switchable power unit sources, the matter may be resolved to a way extent[1,2].

Apart from the aforesaid ways, the system losses also can be reduced via distribution of reactive power within the system for rising the soundness of an influence system. Great deal of reactive power flow during a system is indicated by the important power loss within the system. So minimizing the important power loss ensures optimized reactive power flow (ORPFP) through the lines. Reactive power optimization by real power loss reduction will increase the facility system social science to some extent[3,4]. Reactive power optimization by reduction of real power loss has long been tried for voltage stability improvement.
Optimal reactive power flow is a very important tool in terms of secure and operation of installation. It’s a robust idea for installation operation and designing. In ORPF, the network active power loss is reduced and voltage profile is improved whereas satisfying a given set of in operation and physical constraints.

**PROBLEM FORMULATION**

**FPA ALGORITHM**

The ORPF problem is formulated as Minimize,

\[
RPL = \sum_{k \in S} g_i \left( |V_i|^2 + |V_j|^2 - 2 |V_i| |V_j| \cos \delta \right)
\]

Subject to,

\[
P_{G_i} - P_{D_i} - \sum_{j=1}^{N^B} V_j [G_{ij} \cos(\delta_{ij}) + B_{ij} \sin(\delta_{ij})] = 0
\]

\[
Q_{G_i} - P_{D_i} - \sum_{j=1}^{N^B} V_j [G_{ij} \sin(\delta_{ij}) - B_{ij} \cos(\delta_{ij})] = 0
\]

\[
Q_{G_{\text{lim}}} \leq Q_{G_i} \leq Q_{G_{\text{lim}}}
\]

\[
T_{\text{min}} \leq T_t \leq T_{\text{max}}
\]

\[
V_{G_{\text{min}}} \leq V_{G_i} \leq V_{G_{\text{max}}}
\]

\[
Q_{C_{\text{min}}} \leq Q_{C_i} \leq Q_{C_{\text{max}}}
\]

The pollen of each flower is defined to represent the control parameters as:

\[
pollen = [V_{g_1}, V_{g_2}, \ldots, V_{g_{\text{max}}}, T_1, T_2, \ldots, T_s, Q_{c_1}, Q_{c_2}, \ldots, Q_{c_w}]\]

The FPA searches for the optimal solution by minimizing a cost function. The cost function in the existing approaches is obtained by combining the objective and constraint functions and is written as

\[
\text{COST} = RPL + \lambda_1 \sum_{i \in S} (V_{L_i} - V_{L_{\text{lim}}}^{\text{min}})^2 + \lambda_2 \sum_{i \in S} (Q_{G_i} - Q_{G_{\text{lim}}}^{\text{min}})^2
\]

\[
V_{L_{\text{lim}}}^{\text{min}} = \begin{cases} V_{L_{\text{lim}}}^{\text{min}} & \text{if } V_{L_i} < V_{L_{\text{lim}}}^{\text{min}} \\ V_{L_i} & \text{if } V_{L_i} > V_{L_{\text{lim}}}^{\text{max}} \\ \text{else} & \end{cases}
\]

\[
Q_{G_{\text{lim}}}^{\text{min}} = \begin{cases} Q_{G_{\text{lim}}}^{\text{min}} & \text{if } Q_{G_i} < Q_{G_{\text{lim}}}^{\text{min}} \\ Q_{G_{\text{lim}}}^{\text{max}} & \text{if } Q_{G_i} > Q_{G_{\text{lim}}}^{\text{max}} \\ Q_{G_i} & \text{else} \end{cases}
\]

The way toward producing another arrangement of blooms from the arbitrarily created introductory populace through worldwide and neighborhood fertilization might be called a cycle. The emphatess might be proceeded by taking the populace got in the past cycle as the underlying populace for next emphasis\(^{[5,6]}\). The blossom having the best cost work esteem is put away alongside its target work at every emphasis. The FPA iterative procedure of producing new populace can be ended after a settled number of emphases\(^{[7,8]}\). The calculation of the proposed arrangement approach for tackling the ORPF issue is illustrated.

**FLOWER POLLINATION ALGORITHM**

Each plant may have different blooms, which discharge millions and even billions of dust gametes. But that as it may, for straightforwardness, it is accepted that each plant has just a single bloom, and each blossom creates just a single dust gamete. Along these lines, there is no compelling reason to recognize a dust gamete, a bloom, a plant or answer for a problem. This straightforwardness implies an answer is proportionate to a blossom as well as a dust gamete. Due to the physical closeness and different factors, for example, wind, neighborhood fertilization can have a noteworthy portion \(p\) in the general fertilization activities. Besides, worldwide and nearby fertilizations are considered in the calculation. In worldwide fertilization step, dusts can go over a long separation by creepy crawlies. This guarantees the fertilization and generation of the most fittest, . Along these lines, worldwide fertilization step and blossom steadiness step can be spoken to by

\[
x_{i+1} = x_i + \gamma \cdot L(\lambda) \cdot (x_i - g^*)
\]

Where \(x_i\) is the pollen of flower \(i\) at \(t\)-th iteration and \(g^*\) is the current best solution found among all solutions at the current generation. Here \(\gamma\) is a scaling factor controlling the step size \(L(\lambda)\) the Levy flight based step size that corresponds to the strength of the pollination. Since long distances can be covered using various distance steps, aL’evy flight can be used to mimic this behavior efficiently. That is, \(L > 0\) from aL’evy distribution.

\[
L \approx \frac{2\Gamma(\lambda)}{\Gamma(\lambda)} \frac{1}{s^{1+\lambda}}, \quad (s > s_o > 0)
\]

Here \(\Gamma(\lambda)\) is the standard gamma function, and this distribution is valid for large steps \(s > 0\). For the local pollination, both Step 2 and Step 3 can be represented as

\[
x_{i+1} = x_i + \sigma(x_{n} - x_p)
\]
Where $x^t_n$ and $x^t_p$ are pollen from different flowers of the same plant species mimicking the flower constancy in a limited neighborhood. For a local random walk, $x^t_n$ and $x^t_p$ comes from the same species then $\epsilon$ is drawn from a uniform distribution as $[0, 1]$. On a fundamental level, blossom fertilization exercises can happen at all scales, both nearby and worldwide. Truth be told contiguous blossom patches are pollinated by neighborhood bloom dust than those distant. With a specific end goal to copy this, one can adequately utilize a switch likelihood (Step 4) $p$ to switch between basic worldwide fertilization to serious neighborhood fertilization. One can utilize an estimation of $p = 0.5$ as an underlying quality. A starter parametric demonstrated that $p = 0.8$ may work better for most applications. Flowering plants have advanced some intriguing highlights of bloom pollination and we have effectively built up another calculation to imitate their attributes. This goes about as investigation moves. Then again, blossom consistency guarantee that similar types of the blossoms (along these lines comparative arrangements) are picked all the more as often as possible and accordingly ensure the union all the more rapidly. This progression is basically a misuse step. The interchange and communication of these key segments and the determination of the best arrangement guarantee that the calculation is extremely productive.

TEST BUS SYSTEM

- Total active power demand = 283.4 MW
- Total reactive power demand= 126.2 MW
- Population size=50
- $P=0.8$
- Number of iterations=200

<table>
<thead>
<tr>
<th>SL.No</th>
<th>Parameter</th>
<th>30-Bus System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Buses</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Branches</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>Generator Buses</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Shunt Capacitors</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Tap Changing Transformers</td>
<td>4</td>
</tr>
</tbody>
</table>

Fig.1: Real Power Loss and Fuel Cost

CONCLUSION

In this paper, a totally one of a kind FPA based for the most part change algorithmic program is anticipated to unwind multi-target ideal responsive power stream disadvantage. The execution of the anticipated algorithmic program for assurance ORPF issues is incontestable abuse IEEE-30 transport framework. The outcomes zone unit contrasted with those of various calculations like PSO and BBO. The check comes about plainly display that FPA outflanks distinctive reportable procedures regarding answer quality. The predominance of the anticipated FPA strategy is extra articulated for monster framework as is obvious from IEEE-30 transport framework. FPA based for the most part change strategy is fit for accomplishing universal ideal answer. This paper demonstrates that such enormous outcomes with entirely unexpected target capacities demonstrates that makes the anticipated FPA change procedure is decent in adapting to office change issues.

Ethical Clearance- Done by own Interest and with research committee

Source of Funding- Self

Conflict of Interest- Nil

REFERENCES


Speed Control of Brushless DC Motor Using Line to Line Back EMF by ANFIS Controller

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ABSTRACT

Permanent magnet brushless machines are appreciably used for servo derives, deliver propulsion systems, traction drives, laptop, automatic office drives of many electronics and minuteness machine. BLDC motor has higher performance, higher torque density, lower cost and simpler structure, evaluating to BLAC vehicles.

To alternate the characteristic of brushes and commutators, the BLDC motor calls for an inverter and a function sensor that detects rotor role for correct commutation of modern. Due to the problems of the fee and reliability of rotor role sensors, prompted research within the area of Sensorless BLDC motor drives has been taking place and to offer powerful velocity control. This challenge is to develop a pace control for BLDC Motor in low price to improve the performance. Normally the BLDC motor is directly pushed using 3 phase pulsed dc deliver, because of this the velocity control output will not be smooth, and same time due to three pair of switching inverter, produce more switching loss and hardware price is high. So we’re going to use Six-Switch inverter with brought capacitor to invert Single phase to a few section inverter.

The idea of Sensorless direct pace control in brushless motor power, is not like the conventional sensor less speed manage, the proposed strategy does no longer need proportional plus essential regulator. It is possible by means of powerful manage of returned EMF. Thus remarks mechanism might be minimized. The BLDC motor is worked up based totally on a look-up desk. This suggestion is relevant to each -phase and 3-section conduction modes of the BLDC vehicles.

Keywords: BLDC motor, BLAC vehicles, servo derives, EMF

INTRODUCTION

Permanent magnet (PM) brushless dc (BLDC) motor is increasingly more being utilized in numerous areas which includes automotive, computer, industrial, and household products, etc., and its marketplace is swiftly developing. This is specially because of its high performance, high torque, ease of manipulate, and lower protection. The three-section wye-linked BLDC automobiles are typically supplied with a six-step 2π/three inverter, and for assuring the everyday machine operation, the rotor role indicators are essential. Traditionally, a rotor function sensor which includes hall detail is used for detecting the rotor function in BLDC motor because of its simplicity and coffee price. The idea of sensor much less direct pace control in brushless motor power, not like the conventional sensor much less pace manage, the proposed strategy does not need proportional plus critical regulator, as a consequence feedback mechanism is minimized. Speed regulation is chivvied with the aid of controlling rotational velocity flux linkage.

When the ideas of the proposed sensor less approach, pace ripple to be minimized with assessment of conventional approach (Sensor method).

Brushless dc automobiles are unexpectedly gaining reputation inside the appliance, car, aerospace, customer, medical and commercial automation industries. As a end result of the absence of mechanical commutators and brushes and the permanent magnet rotor, brushless dc
motors have many advantages over the comb dc and induction motor\cite{1,2}. Some of the blessings of brushless dc automobiles are:

(1) High energy density, low inertia and excessive torque to inertia ratio and high dynamic reaction because of the small size, low weight and excessive flux density neodymium-iron-boron everlasting magnet rotor.

(2) High performance due to the low rotor losses because of the absence of current wearing conductors at the rotor and reduced friction and windage losses within the rotor.

(3) Long working life and excessive reliability because of the absence of brushes and metallic commutators.

(4) Clean operation because of the absence of brushes, resulting in no brush dust throughout operation and making an allowance for smooth room applications.

(5) Low audible noise operation because of the absence of brushes, commutators and clean low air resistance rotor.

(6) High velocity operation in excess of eighty,000 rpm is feasible, for the reason that these cars are electronically commutated and are not subjected to the limitations of traditional commutations.

(7) Low thermal resistance for the reason that most of the device losses occur inside the stationary stator, thereby allowing warmth dissipation via the manner of direst conduction. In addition, since the rotor losses are small, heat switch to system tools and paintings pieces when these motors are applied in device equipment is minimal, thereby decreasing the outcomes of warmth on the machining operation.

(8) Low EMI/RFI because of the absence of brushes and metallic commutators.

As an end result of the above functions, the brushless dc motor has been changing different motors in many industries. The family appliance enterprise has been one of the quickest growing stop product market for adjustable pace drives. Brushless dc cars are actually being used in refrigeration compressors, washing machines, fans, meals processing equipment and vacuum cleaners inside the family appliance enterprise.

In the car enterprise, brushless dc motors are being utilized in fuel pumps, air-condition blowers and engine cooling enthusiasts. The brilliant features of brushless dc motors described above are responsible for their significant use in lots of industries, but, a overview of the literature did not provide motor operational characteristics based at the diverse phenomena happening within the motor.

Since the operational characteristic of a motor is vital for its manage, modeling and deriving premiere overall performance, this paper is centered at the dedication of the energization collection of the motor, its effect on electromagnetic torque manufacturing and the utilization of the torque production mechanism for the category of the brushless dc motor.

**Block Diagram**

![Block Diagram of Sensorless Control of Brushless DC Motor](image-url)
POWER SUPPLY UNIT

As all of us understand any invention of recent era can’t be activated without the supply of strength. So it this rapid moving global we deliberately need a right strength source a good way to be apt for a specific requirement. All the digital components starting from diode to Intel IC’s most effective paintings with a DC supply ranging from \(+5v\) to \(+12\). We’re utilizing for the equal, the most cheapest and generally to be had strength source of 230v-50Hz and stepping down, rectifying, filtering and regulating the voltage. This will be dealt in short within the forth-coming sections.

10µf/25v: for maintaining the stability of the voltage at the load side.

0,1µf : for bypassing the high frequency disturbances

VOLTAGE REGULATORS

The voltage regulators play an essential position in any energy supply unit. The number one reason of a regulator is to useful resource the rectifier and filter circuit in providing a regular DC voltage to the tool. Power components without regulators have an inherent hassle of converting DC voltage values due to variations within the load or because of fluctuations within the AC liner voltage. With a regulator connected to the DC output, the voltage may be maintained within a close tolerant area of the preferred output. IC7812 and 7912 is used on this assignment for presenting \(+12v\) and \(-12v\) DC deliver.

NEURO FUZZY LOGIC:

In the sector of artificial intelligence, neuro-fuzzy refers to combinations of synthetic neural networks and fuzzy good judgment. Neuro-fuzzy turned into proposed\(^{[3,4,5]}\). Neuro-fuzzy hybridization results in a hybrid sensible device that synergies these techniques by combining the human-like reasoning fashion of fuzzy systems with the gaining knowledge of and connection list structure of neural networks. Neuro-fuzzy hybridization is widely termed as Fuzzy Neural Network (FNN) or Neuro-Fuzzy System (NFS) in the literature. Neuro-fuzzy device (the greater popular time period is used henceforth) incorporates the human-like reasoning fashion of fuzzy structures via the use of fuzzy units and a linguistic version consisting of a hard and fast of IF-THEN fuzzy guidelines. The major electricity of neuro-fuzzy structures is that they’re popular approximates with the potential to solicit interpretable IF-THEN guidelines.

The strength of neuro-fuzzy structures involves contradictory necessities in fuzzy modeling: interpretability as opposed to accuracy. In exercise, one of the properties prevails. The neuro-fuzzy in fuzzy modeling studies subject is divided into regions: linguistic fuzzy modeling this is centered on interpretability, in particular the Mamdani model and particular fuzzy modeling that is focused on accuracy\(^{[6]}\).

Although normally assumed to be the realization of a fuzzy device through connectionist networks, this time period is also used to describe a few different configurations\(^{[7,8,9]}\) which includes:

- Deriving fuzzy rules from trained RBF networks.
- Fuzzy logic based tuning of neural network education parameters.
- Fuzzy good judgment criteria for growing a network size.
- Realising fuzzy membership characteristic via clustering algorithms in unsupervised gaining knowledge of in SOMs and neural networks.

It have to be pointed out that interpretability of the Mamdani-type neuro-fuzzy systems can be lost. To improve the interpretability of neuro-fuzzy systems, certain measures must be taken, in which critical components of interpretability of neuro-fuzzy systems also are mentioned. A latest research line addresses the facts flow mining case, where neuro-fuzzy structures are sequentially up to date with new incoming samples on call for and on-the-fly. Thereby, system updates do no longer most effective consist of a recursive edition of model parameters, but additionally a dynamic evolution and pruning of model additives (neurons, policies), with a purpose to handle concept float and dynamically changing device conduct effectively and to hold the structures/fashions “up to date” each time.
CONCLUSION

The applications of brushless DC (BLDC) motors and drives have grown significantly in recent years in the appliance industry and the automotive industry. Sensorless BLDC drive are very preferable for compact, low cost, low maintenance, and high reliability system. The conventional sensorless method based on neutral motor point has limited its application since it has relative speed range, suffering from high common mode voltage noise and high frequency switching noise. In this thesis, a novel back EMF sensing technique, direct back EMF sensing, without motor neutral voltage for BLDC drives is proposed, analyzed, and extended, overcoming the drawbacks of the conventional scheme.

Ethical Clearance - Done by own Interest and with research committee

Source of Funding - Self

Conflict of Interest - Nil

REFERENCES


Sequelae of Recurrent Impact with Radiofrequency in Mice

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ABSTRACT

This study aimed to point out the probable sequelae when the mice are being exposed to radiofrequency (RF). As a protocol for this study, used thirty two male mice that were allocated into two equal groups of sixteen males to each randomly. The comprised parameters of the study were reproductive and histological aspects. The male mice of the exposure group were exposed to RF of 900 MHz for five hours daily. This experimental regime was followed for 45 days. The results revealed that exposure to RF caused a significant increase in dead sperms, abnormal sperms and significant decrease in sperms count, individual and massive movement, and alive sperms of the exposed group as compared with those of the control group. It was also seen that final body weights of control group increased significantly throughout the experimental period, compared with initial body weight, while exposed group registered significant decrease in final body weight compared with initial body weight at (P≤0.05). For the histopathological changes, it was obvious that the RF caused a variety of damages to the hepatic and splenic tissues like infiltration of inflammatory cells, cellular swelling, hemorrhage, pyknosis and dilation of central hepatic vein. Necrosis, sloughing of capsule, white pulp hemorrhage, and presence of megakaryocytes were the dominants effects on spleen.

Keywords: radiofrequency, reproduction, liver, spleen, mice.

INTRODUCTION

The sources and routes of exposure to the different forms of electromagnetic radiation include vast and large list and of course both human beings and animals are exposed. Researches on the electromagnetic radiation were made in huge numbers. Some of these researches ensure the deleterious effects of electromagnetic radiation and others decline that. However, the aim of our study is to point out the suspected effects of RF when it is directed into mice and the frequency of the RF in this study was selected to be 900 MHz which is within the range of mobile phones operating. Our mobile phones are considered as radio devices which operate in a range of radio frequency between 800-2000 MHz (1). The vast use of mobile phones is fast spreading in the world especially in the developing and industrial countries (2). One must remember that not only the mobile phones emit electromagnetic radiation but there are plenty of devices which do so but the phones are the most effective because of their wide and long use. Of these devices which emit RF for instance the domestic electrical devices, radio and TV (3). Many health troubles could then arise because of the exposure to RF, of these are short-term memory impairment, cerebral tumors, headaches, insomnia, fatigue, different forms of cancer, neuroendocrine malfunctions, depression and reproductive problems. The cases of sterility among people within reproductive ages has been estimated up to 15% with a tendency to elevate in future. Significant declination in quality and quantity of sperm without a clear reason of the inferior semen parameters which is referred to as idiopathic infertility has been mentioned (4, 5). Other studies have declared the effects of RF on histological and chromosomal level where they have mentioned that RF might induce chromosomal deteriorations in polychromatic erythrocytes belonging to marrow of male rats(6), chromosomal and histological damages(7, 8), disturbance in cellular activity and functions (9), and parenchymal destruction of hepatic tissue (10).

METHODOLOGY

This experiment was performed at the laboratory of researches, College of Medicine, Al-Muthanna
University. Thirty two male mice, weighted 20 – 25 grams and aged 12 weeks were adopted. The laboratory conditions were unified as 20 – 25 C˚ room temperature, 50% humidity, and maintained on a typical diet (table3) and water daily.

**Protocol of Experiment**

The animals of this experiment were randomly allocated into two equal groups of 16 male mice each. Mice were treated as follow:

Control group. Sixteen male mice were used and euthanized after 45 days for the required tests.

Exposure group. Sixteen male mice were exposed to (RF, 900 MHz) for 5 hours daily and euthanized after 45 days for the required tests.

The (RF) – radio frequency – were obtained by the use of frequency generator (Type D 14, No. 36943. Dan bridge-Denmark made).

*Initial body weights were recorded. Body weights also were recorded weekly for 6 weeks.

1- **Reproductive parameters**

When the experimental period ended, final body weights were recorded and the mice were euthanized. Testes were chopped and the epididymis were isolated for the sperms viability measurements. Massive and individual sperms movement, total sperms concentration, dead and alive sperms, and the sperms malformations were tested.

A. Massive sperms motility measurement. It was done according to (11) method.

B. Individual sperms motility measurement. This was measured depending upon the graduation basis suggested by (12).

2- **Histological preparations**

Sorted fragments of liver and spleen were taken from both groups and prepared for histological study according to the method of (13).

*Statistical Analysis*

t-test was used according to (IBM SPSS, version 20) program to find the significant differences among groups (IBM SPSS, 2011).

**RESULTS AND DISCUSSION**

It is obvious from the results that exposure to RF caused significant decrease in body weights of the exposed group throughout the period of the experiment in case they were compared with control group or with their records at the start of the experiment. Vice versa the body weights of the control group increased significantly throughout the period of the experiment (table-1).

The results also revealed that (RF) caused significant increase in dead and abnormal sperms and decrease in sperms count, alive sperms, individual and massive movement of the exposed group comparing with control (table-2). RF also caused different malformations in the sperms of the exposed group which appeared as double head sperms, double tail sperms, curved sperms, double tail and headless sperms comparing with the normal sperms of the control group. It was also seen that there were severe effects on hepatic parenchyma like edema, dilatation of sinusoids filled with fibrin, hepatocytes and nuclei swelling, per-central vein infiltration of inflammatory cells and pyknosis (figure 1, 2, and 3). The spleen was also affected by (RF) where there was sloughing in splenic capsule which appeared wrinkled and disconnected from the tissue in some areas. Hemorrhagic area in the white pulp was clear which indicates hemorrhagic spleenitis. Presence of megakaryocytes in the white pulp with a pale area of infarction and necrosis was noticed (fig 4, 5 and 6). These results came in accordance with studies of (14, 15).

Body weight declination of the exposed animals can be explained as the (RF) leads to a state of hypoxia which in turn results in an oxidative stress which is responsible for the body weight loss (16,17), and this result comes in line with (18).

The effects of RF on the sperms in the present study was in line with (19, 20). The effect of RF on sperms aspects can be explained by three mechanisms: an RF-specific effect, a thermal molecular effect, or both of them (20). Another study on mice by (21) mentioned that Leydig cells are among the most susceptible cells to RF, thus any damage to Leydig cells might afflict spermatogenesis. RF might also be harmful to spermatogenesis via elevating the overall body or tissue temperature (22, 23). The slow motile sperm could be also related to the accumulative effect of radiation effects (24). Further explanation could be that melatonin decreases
under effect of RF which might predispose sperms to oxidative stress \(^{(25)}\). In addition to all mentioned above, RF effects on sperms could be a result of DNA damage \(^{(26)}\).

For the mechanisms by which RF could afflict the hepatic and splenic tissue in this study, one explanation relates the RF with its genotoxic effect on DNA and hematopoietic stem cells throughout the reactive oxygen species and their damaging role on tissues considering the liver and spleen as hematopoietic tissues \(^{(27)}\). Another explanation relates the RF effect with its thermal impact where RF exposure could heat the different body tissues leading for many pathological and physiological disturbances \(^{(28)}\).

**Table (1). RF effect on mice body weight**

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>DAY 1</th>
<th>DAY 7</th>
<th>DAY 14</th>
<th>DAY 21</th>
<th>DAY 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL</td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>24.11 ± 0.68</td>
<td>25.21 ± 0.8</td>
<td>26.46 ± 0.4</td>
<td>27.47 ± 0.4</td>
<td>27.77 ± 0.28</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>EXPOSED</td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>24.03 ± 0.6</td>
<td>23 ± 0.3</td>
<td>22.04 ± 1</td>
<td>21.34 ± 0.6</td>
<td>20.93 ± 0.62</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Capital letters represent the significant differences between groups (Compared vertically)

Small letters represent the significant differences within group (Compared horizontally)

**Table (2). RF effect on mice sperm aspects**

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>Individual movement (%)</th>
<th>Massive movement (%)</th>
<th>Sperms count (×10⁶ / ml)</th>
<th>Abnormal sperms (%)</th>
<th>Dead sperms (%)</th>
<th>Alive sperms (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL</td>
<td>a 85 ± 0.48</td>
<td>a 81 ± 0.64</td>
<td>a 183.2 ± 0.98</td>
<td>b 8 ± 0.6</td>
<td>b 17 ± 0.43</td>
<td>a 75 ± 0.6</td>
</tr>
<tr>
<td>EXPOSED</td>
<td>b 10.08 ± 1</td>
<td>b 19.33 ± 1.61</td>
<td>b 10.08 ± 1.56</td>
<td>a 20 ± 1.60</td>
<td>a 70 ± 1.95</td>
<td>b 19 ± 1.41</td>
</tr>
</tbody>
</table>
Figure (1). Represents Control liver (H and E Stain, 10X). Normal central vein (A) and normal hepatocytes (B).

Figure (2). RF exposed liver (H and E Stain, 40X). Dilated central vein (A) and swelling of hepatocytes (B).

Figure (3). RF exposed liver (H&E Stain, 40X). Pericentral vein infiltration of inflammatory cells (A) and pyknosis hepatocytes (B).

Figure (4), represents Control spleen (H and E Stain, 10X). Normal capsule (A), white pulp (B) and red pulp (C).

Figure (5). RF exposed spleen (H&E Stain, 10X). Sloughing of capsule (A) and white pulp necrosis (B).

Figure (6). RF exposed spleen (H&E Stain, 40X). Megakaryocyte (A) and hemorrhage (B).

**Ethical Clearance:** Research implemented according to ethical approval of scientific research of ministry of higher education and scientific research Iraq.

**Conflict of Interest:** None

**Source of Funding:** Self

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Incidence of Cervical Ribs and its Association with other Bony Abnormalities in Population of Al-Muthanna, Iraq

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1Neurosurgeon, College of Medicine, 2Physiologist, College of Medicine, 3Radiologist, College of Medicine, 4Biologist, College of Medicine, Al Muthanna University, Iraq

ABSTRACT

Background: A supernumerary process from seven cervical vertebra is called cervical rib. The presence of pain and numbness were depended in diagnosis. The presence of fibrous band would cause compression to the brachial plexus and subclavian artery.

Methods: Total of 800 patients as 440 males and 360 females were studied from January to December 2017. The study comprised radiologic review of adult cervical spine and looking for the presence of cervical ribs and elongated transverse process.

Results: Out of 800 patients 161 (20 %) were found with cervical ribs. Out of 161, 66 (9.25 %) were having bilateral cervical ribs predominantly in females 46 (5.75 %). Right side was affected more than the left side (R 46: 5.7%, LT 31: 3.8 %).

Conclusion: The prevalence of cervical ribs and elongated transverse process in our population is higher than that reported in other populations. However it was observed that the symptoms reported in literature were in relation with the neurological manifestation which is more frequent than vascular.

Keywords: Cervical spine, supernumerary, compression, neurovascular.

INTRODUCTION

The cervical ribs are now faith by the medical community to be a cause for disease and underlying disease genotype. It may be bony or partially fibrous while attaching itself to the first rib or to the sternum causing compression of adjacent neural strictures especially the lower trunk of the brachial plexus and subclavian artery (1). It is usually diagnosed in the middle age group because at middle age the shoulder starts drooping which causes the cervical rib to get depressed and lead to compressing the nerve roots of the concerned area (2). Cervical ribs or fibrous band are just one feature that leads to narrowing and compression at the outlet with poor posture, shoulder droop and large breast can cause compression to the neurovascular strictures (3). The cervical rib cannot be confidently diagnosed in young children as costal process of C7 may not be fused with C7 vertebra until the age of Ten (4). A researcher claimed that the vascular compression could also be due to paralysis of sympathetic nerve supply (5). Others described the symptom of thoracic outlet syndrome as neurogenic mostly (90%) and not vascular and the subclavian artery compression in their study was related to first rib and not to cervical rib (6).

Cervical X ray, CT and MRI can distinguish cervical rib or fibrous band. Tight anterior or middle scalene muscle can cause elevation of the first rib or may be found as displaced fractures of clavicle, cervical spine degenerative changes, and herniated cervical disc. Doppler and plethysmography studies can show impediment of blood flow. Occlusion can occur in normal subject but is unusual and is not related to age (7). Objectives of this study were to see the prevalence of cervical rib in people of Al- Muthnna governorate

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and its association with gender, body side, and other bony anomalies and correlation with the studies already reported.

**MATERIALS AND METHOD**

We reviewed eight hundreds patents complaining from cervical pain with unilateral or bilateral radiculopathy (age above 20 years). 440 females and 360 males at the out patients’ department in AL-Husain teaching hospital, Samawa, Iraq, were taken during 12 months period between January and December 2017. The reviewed X-ray had to meet our criteria. We only accepted those with clear, unobstructed visualization of seventh cervical and first thoracic vertebra. Exclusion the technical inadequacy or inadequate exposure. All approved X-ray were posterior – anterior projection without rotation. A radiograph showing the presence of cervical rib, elongated transverse process (transversomegaly) or any other defect. The following criteria from diagnosing cervical rib were used:

1-The rib must be about the seventh cervical vertebral transverse process. Which is seen to project caudally or lateral from the spine.

2-It must have no articulation with the manubrium sterni, but may do so with the first rib.

3-To be fixed as a rib it must be discrete from transverse process of C7. The elongated transverse process of C7 is any process that projects beyond the lateral limits of the first thoracic vertebra.

The diagnosis was made by fulfilling at last three of the following criteria:

1-A history of symptom aggravation by having the arm in an elevate position.

2-A history of C8 – T1 paresthesia.

3-Supraclavicular tenderness over the brachial plexus.

4-Patients unable to continue the Roos test for 3 minutes.

The study depend on many positive test such as Adsons test, Tinels test, hyper abduction test, costo clavicular test (Edens test) and Roos test.

**OBSERVATION RESULT**

We found 161 (20.12 %) with cervical ribs among 800 persons. out of which 66 (9.25 %) bilateral and 95 (11.87 %) unilateral so statistically there was unilateral predominance.

Over the entire unilateral incidence were more common in male 85 (10.6 %) than the female (10 1.25 %). Whereas bilateral incidence was more common in female 46 (5.75 %) than male 20 (2.75 %).

Among 161 persons with cervical ribs only 7 were left handed and rest right handed. All 7 left handed (2 males and 5 females) and unilateral more than bilateral (Table 1).

The vast of majority of patients studied were between 20 – 70 years. here was predominant bilateral cervical rib in this study, the age group 20 – 30 years giving a prevalence rate 24%, fifty six (32 %) from the 31 – 40 years age group with the prevalence rate of (21.5 %) from the 41 – 50 years age group with the prevalence rate (21.4 %) and 30 cervical rib for age 50 - 60 years and 61 - 70 years age group giving 18 % and 10% respectively (table 2).

In term of symptoms with respect to the presence of cervical rib, 88 (92.6 %) out of 95 patients presented with pain in the forearm and hand especially the inner side corresponding to the little fingers, while only 7 patients (7.3 %) complaining from neck pain.

The patients with bilateral cervical ribs 36 (54.5 %) complaining from pain radiated to the forearm and hands while 30 (45.4 %) complaining from neck pain which give no statistically significant (Table 3).
**Table 1: Sex & handed distribution of cervical rib**

<table>
<thead>
<tr>
<th>Condition with cervical rib</th>
<th>total</th>
<th>male</th>
<th>female</th>
<th>Right side</th>
<th>Left side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over all</td>
<td>161(20.1%)</td>
<td>75(9.37%)</td>
<td>86 (10.75%)</td>
<td>154(19.2%)</td>
<td>7 (0.8%)</td>
</tr>
<tr>
<td>Bilateral</td>
<td>66(9.25%)</td>
<td>20(2.7%)</td>
<td>46 (5.75%)</td>
<td>64 (8%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td>Unilateral</td>
<td>95(11.87%)</td>
<td>85(10.6%)</td>
<td>10 (1.25%)</td>
<td>90 (11.2%)</td>
<td>5 (0.6%)</td>
</tr>
<tr>
<td>Unilateral, right side</td>
<td>46(5.75%)</td>
<td>26(3.25%)</td>
<td>20 (2.5%)</td>
<td>#</td>
<td>#</td>
</tr>
<tr>
<td>Unilateral, left side</td>
<td>31(3.8%)</td>
<td>17(2.1%)</td>
<td>14 (1.7%)</td>
<td>#</td>
<td>#</td>
</tr>
</tbody>
</table>

**Table 2: Age distribution of patient with cervical rib**

<table>
<thead>
<tr>
<th>age group</th>
<th>frequency</th>
<th>Cervical rib</th>
<th>prevalence</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>year</td>
<td>percent</td>
<td>Number</td>
<td>%</td>
<td>Bilateral</td>
</tr>
<tr>
<td>20-30</td>
<td>108 (13.5%)</td>
<td>26</td>
<td>24%</td>
<td>9</td>
</tr>
<tr>
<td>31-40</td>
<td>260 (32.5%)</td>
<td>56</td>
<td>21.5%</td>
<td>23</td>
</tr>
<tr>
<td>41-50</td>
<td>196 (24.5%)</td>
<td>42</td>
<td>21.4%</td>
<td>18</td>
</tr>
<tr>
<td>51-60</td>
<td>166 (20.75%)</td>
<td>30</td>
<td>18%</td>
<td>12</td>
</tr>
<tr>
<td>61-70</td>
<td>70 (8.75%)</td>
<td>7</td>
<td>10%</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>800 (100%)</td>
<td>161</td>
<td>66</td>
<td>95</td>
</tr>
</tbody>
</table>

**Table 3: Cervical ribs in patient with symptoms.**

<table>
<thead>
<tr>
<th>Cervical rib</th>
<th>No.</th>
<th>Radiated pain</th>
<th>Neck pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilateral</td>
<td>66</td>
<td>36 (54.5%)</td>
<td>30 (45.4%)</td>
</tr>
<tr>
<td>Unilateral</td>
<td>95</td>
<td>88 (92.6%)</td>
<td>7 (7.3%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The cervical rib or neck rib is a supernumerary rib which arises from the costal element of the seventh cervical vertebra (8-10). According to the embryologists it is reported to the presence always in the fetuses and disappears just before birth (11).

The signs and symptoms of thoracic out let syndrome are pain, tingling and numbness which differentiated from angina pain by increase on raising the affected arm in the former while in angina pain worsens on walking or exertion, cervical rib can also cause sign and symptom by compression of subclavian artery causing ischemia of the arm and brachial plexus causing neurogenic symptoms and radiculopathy (8,9).

The finding in relation with symptoms is consistent with the well-known knowledge that very few patients presented with symptoms such as pain, tingling numbness in forearm and arm, motor symptoms include weakness of the arm and hands and impaired
fine movement like writing and sewing (12). Most of the previous studies upon radiological evaluation of certain number to determine probable prevalence of cervical spine anomalies and cervical ribs and transversomegaly. The females preponderate and bilaterally which has been found in most of studies also noted by us (13–17). The presence of cervical ribs is usually asymptomatic. Factor like trauma, over use, poor posture or presence of large breast predispose to symptoms. (18) According to the (19) most patients with cervical ribs suffer due to compression of brachial plexus. Another survey conducted by (20) also indicated that neurological manifestations were more frequent than vascular. According to the morphology of cervical ribs it is commonly known that the incomplete ribs affected only the brachial plexus, while the complete ribs also have an impact on subclavian artery, the radiculopathy predominant in unilateral cervical ribs 92.6% while 54.5% in bilateral ribs. The study recorded a high number of female than males (440 vs 360) with the prevalence rate 10.7%. There was predominantly bilateral existence of cervical ribs in this study in contrast to the unilateral cervical rib. This is consistent with finding by (21).

The most common age group of cases was 31–40 years. It is common age for presentation of various disorders of cervical spine like cervical spondylosis and might be reason for increased radiological investigation and because of age activity added more cases and any underlying anomalies. We found 161 (20.1%) persons with cervical rib among 800 complaining from pain, numbness and weakness one or both arms, out of which 66 (9.25%) bilaterally and 95 (11.87%) unilateral. So statistically was a little unilateral predominance, over all unilateral incidence were more common in male (M 10.6%; F 1.25%) whereas bilateral incidence was more common in females (M 2.7%; F 5.7%). Our finding overall prevalence (unilateral and bilateral) of cervical ribs (11.8% and 9.2%) respectively more than the result of (22, 23, 24), but less than finding by (25, 26).

A correct diagnosis of compression of brachial plexus by cervical ribs should include the exclusion of carpal tunnel syndrome, neuritis of the ulnar nerve, or entrapment syndromes of prolapsed enter vertebral cervical disc. Those who are symptomatic are managed conservatively with the use of analgesia, physiotherapy, muscle relaxant and lifestyle modification, those with sever sign and symptoms undergo surgery. The patients in this studied who were symptomatic presented with pain, numbness were managed conservatively.

**CONCLUSION**

The prevalence of cervical ribs and elongated transverse processes is higher than that reported in other population. Thoracic outlet syndrome can be due to so many factors like trauma, poor posture, large breasts, it is important to consider the presence of cervical rib with early identification may prevent neurogenic and vascular complications.

**Ethical Clearance:** The Research Ethical was approved by the ethical committee and the patients read and signed an informed consent forma according to ministry of health and environments in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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Histopathological Comprise between Hysterectomy and Dilatation and Curettage Results

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ABSTRACT

Background: endometrial sampling obtained by dilatation and curettage (DandC) is considered one of the most reliable, easy and rapid method of diagnosis of abnormal uterine bleeding (AUB) bleeding and guiding the gynecologists to the proper management. However, some cases required hysterectomy for further evaluation.

Objective: to assess the validity of histopathological diagnosis obtained with DandC compared to hysterectomy for the diagnosis of abnormal uterine bleeding.

Patients and methods: Between September 2015 to March 2017, all women aged between 40-69 years complaining of AUB attending in Al-Yarmouk hospital were targeted in this study, underwent DandC for the diagnosis of the cause and then hysterectomy done if there is no response to treatment or the DandC results indicates hysterectomy. Examination was done in gynecology clinic in Al-Yarmouk hospital followed by DandC. Endometrial samples were sent to the histopathological department in the hospital. Sensitivity and specificity of DandC were compared with that of hysterectomy as a gold standard to check validity of DandC.

Results: The total number of examined females were 138. The most common recorded age was 60-69 years (38.4%). Postmenopausal bleeding was the most common bleeding type (29%) followed by menorrhagia (20.2%) while metrorrhagia was the least of the presenting types (6%). Endometrial hyperplasia account for 38.4% of the histopathological diagnosis followed by benign histopathological changes (21.1%) while malignancy composed 12.3%. DandC was found a valid method for biopsy sampling for histopathological diagnosis of AUB when compared with that of hysterectomy.

Conclusion: Conventional DandC for endometrial sampling was a valid method for determining endometrial pathology in patients with AUB with a minimum sampling failure and high percent of agreement with gold standard results.

Keywords: perimenopausal, uterine bleeding, dilatation and curettage, hysterectomy.

INTRODUCTION:

Abnormal uterine bleeding (AUB) is the most prevalent gynecological symptom and presentation in gynecological outpatients, occurs in all age groups in women. (¹)

Approximately 70% of peri and postmenopausal women attending gynaecological clinics for AUB and this has a major impact on the women’s quality of life. (²)

Regular period results from ovarian hormone balance lead to regular ovulation. In perimenopause , there will be changes in the hormone levels which affect regular ovulation. In an ovulatory cycle, estrogen secretion will be continued to be secreted from ovary, leads to increasing endometrial thickness. Which in turn leads to a late menstrual period, irregular bleeding and spotting. These changes result in formation of endometrial polyps, hyperplastic changes “endometrial hyperplasia” and in long-standing cases, endometrial

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carcinoma may issue. (3)

Dilatation and curettage (DandC) is used for obtaining endometrial tissue samples for diagnosis of intrauterine endometrial abnormalities that assist in the management of abnormal bleeding. (4) Nonetheless, in spite of the presence of newer techniques to access the uterine cavity and obtaining the endometrial samples, DandC still has a major role in many centers in which advanced technology is not available or were unsuccessful. (5)

There are many indications for DandC including irregular vaginal bleeding, menorrhagia, malignant and premalignant lesion, retained product of conception, polyps and fibroids. (6)

Dilation and curettage may also be a therapeutic procedure in cases of removal of retained products of conception including the incomplete abortion, missed abortion, septic abortion and induced pregnancy termination, also the management and evaluation of the uterine hemorrhage of gestational trophoblastic disease, unresponsive hemorrhage to hormone therapy, (4) and with endometrial ablation for histologic evaluation of the endometrium. (7)

DandC is considered as the most effective, sensitive and safe method of investigating endometrial lesions and determining the cause of these conditions. (8) In recent years, the diagnostic value of DandC has been reported to be as equal as hysterectomy samples. (9) Hysterectomy is an effective method for treatment of abnormal vaginal bleeding and heavy menstrual bleeding. Hysterectomy is carried out when women has completed her family sibling and when medical and less invasive surgical procedure have failed. (10)

There is scarce, if any, data about the utility of DandC compared to hysterectomy in Iraq. In the era of evidence based medicine and the impact of socioeconomic status on disease outcome couples with availability of diagnostic abilities, we felt it necessity to provide an evidence to clinicians and experts in the field.

The aim of this study was to assess the value of DandC as a diagnostic method for endometrial histopathological sampling when compared with hysterectomy for the diagnosis of AUB in the perimenopausal age group females.

**MATERIAL AND METHOD**

This is a cross sectional retrospective study conducted among females aged between 40 and 69 years with AUB examined in Al-Yarmouk hospital in Baghdad, Iraq during the period from September 2015 to March 2017. All affected females during the study period underwent DandC for endometrial biopsy and then hysterectomy done because of either failure of the response to the treatment or the hyperplastic endometrium with atypia. Endometrial samples were fixed in formalin solution and sent to the histopathology department for processing and histopathological examination. Sensitivity and specificity of the D and C were calculated Hysterectomy as a gold standard.

**RESULTS**

A total of 138 females participated in this study. The most common recorded age group was 60 - 69 years (38.4%), followed by 50-59 years (34.8%), then 40-49 years age group (26.8%).

Figure (1) shows the distribution of the types of the presenting AUB. About 29% of the sample presented with postmenopausal bleeding, followed by menorrhagia (20.2%), while metrorrhagia was the least presenting types (6%).

Table (1) shows the types of abnormal uterine bleeding according to their histopathological diagnosis. Regarding the types of AUB, Endometrial hyperplasia types composed the majority (38.4%) of recorded histopathological diagnosis followed by normal and benign histopathological changes (21.1%), while malignancy composed about 12.3% of the cases.
Regarding the histopathological diagnosis as the cause of the bleeding, endometrial hyperplasia (figure -2) was the most common cause of bleeding in all the vaginal bleeding types while malignancy (figure -3) was the most common cause of vaginal bleeding in females presented with postmenopausal bleeding.

**Table (1) shows the types of abnormal uterine bleeding according to their histopathological diagnosis.**

Table (2) shows the testing analysis of the validity of the DandC method for the histopathological diagnosis of the cause of vaginal bleeding when compared with samples taken by hysterectomy as a gold standard.

**Table (2): Validity testing results of the DandC when compared with hysterectomy as a gold standard.**

<table>
<thead>
<tr>
<th>Test</th>
<th>result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Sensitivity</td>
<td>95.19%</td>
</tr>
<tr>
<td>2- Specificity</td>
<td>79.41%</td>
</tr>
<tr>
<td>3- Positive predictive value</td>
<td>93.40%</td>
</tr>
<tr>
<td>4- Negative predictive value</td>
<td>84.30%</td>
</tr>
<tr>
<td>5- Percent of agreement of the test</td>
<td>75.30%</td>
</tr>
<tr>
<td>6- Percent of misclassification of the test</td>
<td>24.6%</td>
</tr>
</tbody>
</table>

Table (3) shows histopathological results of DandC compared to the histopathological examinations after hysterectomy for the same patients. In all cases the histopathological findings were similar except in 5 cases which diagnosed as malignancy by DandC and appear to be complex hyperplasia with atypia after hystectomy (false positive).

**Table (3): Histopathological findings of endometrial sampling by DandC and their results after hysterectomy**

<table>
<thead>
<tr>
<th>Histopathological findings</th>
<th>Histopathological results of specimens obtained by DandC</th>
<th>Histopathological results of specimens after hysterectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal endometrium</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Proliferative phase</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Secretory phase</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Menstrual phase</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Disordered proliferative endometrium</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Cystic glandular hyperplasia</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Simple endometrial hyperplasia without atypia</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Complex endometrial hyperplasia without atypia</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Simple endometrial hyperplasia with atypia</td>
<td>9 , (3) diagnosed as malignant</td>
<td>12</td>
</tr>
<tr>
<td>Complex endometrial hyperplasia with atypia</td>
<td>3 , (2) diagnosed as malignant</td>
<td>5</td>
</tr>
<tr>
<td>Malignancy</td>
<td>17</td>
<td>12 malignancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 complex endometrial hyperplasia with atypia.</td>
</tr>
<tr>
<td>Atrophic endometrium</td>
<td>3 , (2 ) were unsatisfactory samples.</td>
<td>5</td>
</tr>
<tr>
<td>Irregular mixed phase</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
**DISCUSSION**

Endometrial biopsy is an important step in the evaluation of peri- and post-menopausal women presented with abnormal uterine bleeding with the main goal is to detect possible endometrial carcinoma or its pre-malignant state “atypical endometrial hyperplasia”. \(^{(11)}\) The endometrial sample is consider as inadequate when the number of endometrial glands is so few or absent or when the sample is composed of blood clot only. In this study, two samples out of 138 obtained by DandC have been found unsatisfactory (98.6% adequate sample) because they revealed blood clot only with no endometrial tissue while endometrial tissue adequacy was 100% in recordings of Rauf et al \(^{(12)}\) and Ibrahim et al studies.\(^{(13)}\) These two cases in this study were found having atrophic endometrium after doing hysterectomy, which explains some difficulty of getting an adequate sample by the DandC.

The current study showed that sensitivity of DandC in detecting endometrial pathology was 95.19% which is much higher than results found by Bettoocchi et al (46%) \(^{(13)}\) and Sanam et al (49.1%) studies.\(^{(14)}\)

The findings of this study revealed that DandC had a specificity of 79.41% and positive predictive value of 93.4% and negative predictive value of 84.3%. These results conclude that conventional DandC is very accurate way for histopathological assessment of the endometrial pathological changes. This method was found more valid when compared with results of the study conducted by Sanam et al (DandC specificity: 84.5%, positive predictive value: 60.5%, and negative predictive value: 77.5%).\(^{(15)}\)

This study showed that DandC has 100% sensitivity in detecting endometrial hyperplasia without atypia. This finding was much higher than results found by Gungorduk et al (45%).\(^{(16)}\) Regarding the diagnosis of atypical endometrial hyperplasia, the present study revealed that DandC had a diagnostic specificity of 100% and no case of malignancy was missed when compared with result of hysterectomy. This was in contrast with results found by Kurt et al study\(^{(17)}\) who observed that 44.7% of the cases of atypical complex endometrial hyperplasia discovered by DandC then appeared to have well differentiated endometrial carcinoma after hysterectomy. So they advise that all cases of complex hyperplasia with atypia should undergo full assessment preoperatively and treated surgically as malignancy.\(^{(17)}\)

This wide difference in the results of this study from other studies could be attributed to the long experience of the gynecologist who do the DandC sampling technique, the adequacy of the sample or the pathologist’s experience in reading the sample.

<table>
<thead>
<tr>
<th></th>
<th>DandC</th>
<th>Hysterectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic endometritis</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Endometrial polyp</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Psuedodecidual reaction</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Submucosal leiomyoma</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

**Cont... Table (3): Histopathological findings of endometrial sampling by DandC and their results after hysterectomy**

![Figure-2: Endometrial hyperplasia. Stained with HandE. 40X.](image)

![Figure-3: Endometrial carcinoma. Stained with HandE. 40X.](image)
Our study had similar results to that recorded by Sanam et al\(^{(15)}\) who found that atypical simple and complex hyperplasia detected by DandC was consistent with that obtained after hysterectomy.

In the present study, all cases diagnosed as endometrial polyp by D and C were proved to have the same diagnosis after hysterectomy, while Sanam et al\(^{(15)}\) revealed that endometrial polyp can’t be diagnosed by D and C.

Although this study found that no malignant changes has been missed by D and C endometrial sampling, 5 out of 17 cases which were diagnosed as malignancy by D and C found to be atypical endometrial hyperplasia after hysterectomy so that the D and C had sensitivity of 100% and specificity of 96% in diagnosing endometrial carcinoma. This was in agreement with Barut et al\(^{(18)}\) study who observed a sensitivity of 87.8% and 100% specificity in detecting endometrial malignancy by DandC.

The high sensitivity (95.1%), high positive predictive value (93.4%), high test agreement (75.3%) and low misclassification percent (24.6%) of the histopathological results of the endometrial biopsy taken by DandC when compared with that taken by hysterectomy indicated that DandC is a valid and reliable method for histopathological diagnosis of perimenopausal vaginal bleeding and this result will avoid the unnecessary hysterectomy in these conditions.

**CONCLUSION**

Conventional DandC for endometrial sampling was very appropriate method for determining endometrial pathology in patients with PAUB and reduce the need for the drastic hysterectomy for the diagnosis or treatment of these cases.

**Ethical Clearance:** The Research Ethical Committee of ministry of health and environments in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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11- David M Luesley, Mark D Kilby. Obstetrics and


Histopathological Alternations of Placenta in Pregnancy Women Complicated with Gestational Diabetes

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ABSTRACT

Diabetes mellitus is the metabolic disorder, which affect the pregnant mothers as well as their neonates because of its influence on the placenta, the occurrence of which is continue to increase. By studying the placentae of the gestational diabetic pregnancy and comparing it with the placentae of normal pregnancy, we can recognize the changes that occurs in placenta because of gestational diabetes, such as crowding of villi, increased villous number of immature intermediate villi, decreased terminal villi density, increased terminal villi size, numerous syncytial knots, basement membrane thickening in terminal villi, cytotrophoblast in terminal villi, decreased vascular-syncytial membrane thickness, extravillous fibrinoid, fibrosis, fibrinoid necrosis, stem villi and mature intermediate with indented margin, villi with continuous trophoblastic layer, immature intermediate villi with loose reticular stroma and basement membrane thickening as well as increased of Hofbauer cells population, calcification intracellular as well as extracellular, chorangiosis, thickening of villi vessels, fetal vessel thrombosis, nucleated fetal RBCs, edema in terminal and stem villi and villous edema in mature intermediate and which can affect the neonates.

Keywords: Placenta, Gestational diabetes, Histopathology.

INTRODUCTION

The placenta is a highly complex and fascinating organ. During the course of a pregnancy, it acts as the lungs, gut, kidneys, and liver of the fetus. The placenta also has major endocrine actions that modulate maternal physiology and metabolism and provides a safe and protective milieu in which the fetus can develop [1]. When GDM develops, in the maternal tissues, the insulin-dependent glucose uptake is further decreased and hyperglycemia develops. Because the placental transfer of glucose is concentration dependent under conditions of maternal hyperglycemia and placental normal function, there is increased placental transfer of glucose and fetal hyperglycemia and secondary to this alteration, hyperinsulinism develop. Once the umbilical supply of glucose is suddenly arrested after delivery, in the newborn, the remaining hyperinsulinism increases the risk of hypoglycemia [2].

Histopathologically, gestational diabetes has been associated with increased fibrinoid material, villous edema, and thickening of the basement membrane in trophoblastic cells [3]. Thickness of the endothelial basement membrane, and increase in collagen fibers of villous stroma have been described for GDM placentae [4]. However, the gross and histopathological alterations in gestational diabetes placentae are changeable and even somewhat controversial [5].

Thus, the aim of the present study is to investigate the incidence of histopathological alternations in placenta of gestational diabetes and normal pregnancies at term and preterm gestation in Iraqi women.

MATERIAL AND METHOD

Fresh placentae were obtained from Department of Obstetrics and Gynaecology in three hospitals in Baghdad at the period between 1 December 2016 and 1 May 2017. Two studying groups were analyzed: First group, women with uncomplicated, the group was considered as control group (cases n=34). Second group included women with pregnancies complicated by
gestational diabetes mellitus (cases n=34). The mothers’ informed consents were gained according to Local Research Ethics Committee approval in Iraqi Ministry of Health.

Placentae were cut and sampled for histological examination. Two standard samples were taken from the selected lobule of placenta one from the central area and other from the peripheral area. Fresh placental tissue pieces were placed in a labelled clean plastic container containing 10% NBF solution [6]. Tissue samples from placentae after delivery were prepared for histopathological studies according to the methods of [7]. The sections was transferred to glass slides to be stained. Haematoxylin and Eosin staining was accomplished according to Bancroft, et.al. (2013). [8]. The sections were examined by compound light microscope (Meijitechno, Japan) with digital camera (Canon, Japan, 18 megapixels). Images were analyzed independently with the help of expert pathologist by Multihead teaching microscope (Genex, USA).

RESULT AND DISCUSSION

Diabetes is metabolic disorder in the world that has the effect on all the organs of the body, including the temporary organ such placenta, thus can have adverse neonatal outcome, and thus is of serious concern [9]. On investigation of placental sections with light microscope, a numerous of histological variations were recognized in the present study. These variations mentioned as follow:

Crowding of villi (Fig.1-A): In the present study, crowding of villi was seen to be increased significantly higher in DM group followed by GDM group then control group which recorded one case. [10] reported that histological anomalies such as presence crowding of villi was more frequently observed in diabetic placenta this finding agreed with our study.

Increased villous number of immature intermediate villi (Fig.1-B): A placental abnormality that has been individually related with an increased risk of stillbirths [11]. Due to defect in placental maturation have been related with chronic fetal hypoxia [12], a larger rate of immature intermediate villi may be revealing of a better preuterine hypoxic environment [13; 14].

Decreased terminal villi density (Fig1-B): Increasing the size of villi especially terminal and immature intermediate villi, gives the false impress of increased terminal villous density [15]. Number of studies reported an association between the frequency of immature villi and insufficient or absent terminal villi in GDM [15; 16].

Increased terminal villi size (Fig1-B): In the current study, terminal villous size significantly increased in both diabetes groups compared to controls. Mayhew (2002)reported that terminal villi size was statistically different in diabetic placentae compared to control[17].

Numerous syncytial knots (Fig1-C): Increased numerous of syncytial knots, bridges and sprouts are called as syncytial knotting or Tenny-Parker changes [18]. In past study, done by Gheorman, et.al.2012; as compared with the normal placenta, placentae from pregnant women with diabetes showed an increased incidence syncytial knots[19].

Basement membrane thickening in terminal villi (Fig1-D): This histological change of placenta are mainly due to metabolic disturbances that leads to accumulation of carbohydrate and fat in the placenta. Whereby, this thickening is the consequence of mucopolysaccharide storage [18]. This finding was described in various study, [19] who noticed increasing thickening trophoblastic basement membrane were present in most of the diabetic placenta in comparison of normal women.

Cytotrophoblast in terminal villi (Fig1-D): The absence of cytotrophoblast layer could be due to its obvious mitotic division at the 16th week of gestation to form syncytial trophoblast and become incorporated together as a syncytial layer. This incorporation in one homogeneous layer without basement membranes will manage the transport effectiveness through it to meet the increased metabolic supplies of the developing fetus mainly during the second half of gestation (19th- 38th week) [20]. Bentley-Lewis, et.al. 2014; found that placental anomalies in GDM including increased cytotrophoblastic [21].

Decreased vasculo-syncytial membrane thickness (Fig1-D): The barrier between maternal and fetal circulation is reduced by the thinning of the vascular-syncytial membrane. This can negatively affect the transplacental transport, metabolism, and oxygen distributing [22]. Decreased vasculo-syncytial formation can be due to the delayed villous maturation that might be the etiology for the improved risk for intrauterine losses in diabetic women [23].
Extravillous fibrinoid between terminal villi (Fig1-E): Increased of extravillous fibrinoid deposits are reflected pathological phenomena and it was frequently inconsistent with normal fetal growth [24].

Fibrinoid in terminal and stem villi (Fig1-E): Stromal fibrosis is described abnormal when increased in the stem villi. In diabetic women, there is an increased villous stromal oxygen partial pressure, in the side of insufficient uptake by the fetal capillaries, which prompts the synthesis of collagen [25]. [26] observed increased villous fibrosis in GDM placenta controlled by insulin, but such noticing was not seen in GDM placenta controlled by diet and in control women [21; 27].

Fibrinoid necrosis of stem and terminal villi (Fig1-F): Fibrinoid necrosis was recognized as non-cellular homogenous eosinophilic material within the villi. At places, the fibrinoid material had increased by pushing the basement membrane and pressing the complete villous stroma [18]. Histological pathologies such as the presence of fibrinoid necrosis were detected more repeatedly in GDM [21] placentae compared with the control placenta.

Stem villi with indented margin, continued trophoblastic layer and stroma with respectable cell population (Fig1-G): Dubova, et.al. 2011; found to be continued trophoblastic layer and cell population more common in GDM group compared to control group and this result consistent with our finding [11].

Basement membrane thickening in immature intermediate villi (Fig1-H): This thickening of syncytiotrophoblast basement membrane was resulted of a higher degree of nonenzymatic glycosylation or an increased quantity of the prominent type of basal lamina collagen, type IV. As well as higher substances of DNA, phospholipids, triglyceride, and of cholesterol are distinguishing features of placenta in diabetes women [18].

Immature intermediate villi with more loose reticular stroma and increased Hofbauer cells population (Fig1-I): The most often reported alteration in the placenta of diabetic women is the relative immaturity of villous, however a closely best metabolic control in these women [22].

Calcification intracellular as well as extracellular (Fig1-J): In many studies, calcifications observed as intracellular as well as extracellular basophilic deposits after stained with haematoxylin and eosin in the placentae of GDM group [27].

Chorangiosis (Fig1-K): The increased villous chorangiosis probably a response to the relative hypoxemia due to an increase of VEGF expression and the immaturity of the villi, which considered by centrally placed villous capillaries causing in a greater space for oxygen and nutrients to permit from maternal to fetal exchange [28].

Thickening of villi vessels (Fig1-L): Thickness villi vessel walls due to endothelial proliferation and thickening of the basement membrane. As well as it has been observed that increased blood glucose levels prompt oxidative stress (OS) and following variations of the placental architecture [19] principally the vascular properties, which are obvious in diabetic women.

Fetal vessel thrombosis (Fig1-L): This feature was diagnosed when a large fetal stem villous vessel was partly or completely obstructed by a thrombus [29]. The blood vessels in some of the terminal villi showed occulting by thrombus in GDM [13].

Nucleated fetal RBC’s (Fig1-M): Tissue hypoxia consequences in increased levels of erythropoietin, which in turn performs to prompt of erythropoiesis and increased numbers of circulating nucleated fetal RBC’s. The increased erythropoiesis is maybe due to together an increase in erythropoietin levels and an immediate haemopoietic effect of hyperinsulinaemia [14].

Mature intermediate villi with continuous trophoblastic layer (Fig1-N): This histological feature is evidence of villous immaturity in women with diabetes mellitus [18].

Villous edema (Fig1-N,O,P): The accumulation of fluid in the stroma of placental villi. As hyaluronic acid molecules have the particularity to retain water, it was concluded that, the existence of abnormal deposits of mucopolysaccharides in the stroma of villi can lead to the presence of the true villous edema in placentae of diabetic pregnancies [30].
Figure (2): Section of placenta in women complicated with DM showing: A- Crowded villi (4X); B- Decreased terminal villi density and increased size as well as immature intermediate villi (10X); C- Numerous syncytial knots (40X); D- Basement membrane thickness in terminal villi, more cytotrophoblast and decreased vascular-syncytial membrane thickness in terminal villi (100X); E- Present extravillous fibrinoid between chorionic villi and fibrosis inside terminal and stem villi (10X); F- Present fibrinoid necrosis in terminal and stem villi (40X); G- Stem villi with indented margin, continued trophoblastic layer and stroma with respectable cell population (arrow head) (10X); H- Thickening of syncytiotrophoblast basement membrane in immature intermediate villi (40X), I- Immature intermediate villi with more loose reticular stroma and Hofbauer cells population (40X); stem villous (SV) and mature intermediate villous (MV), immature intermediate villous (IV), terminal villous (TV), fibrinoid necrosis (FN), fibrosis inside (IF) chorionic villi, syncytial knots (K), basement membrane (BM), cytotrophoblast (Cy), vascular-syncytial membrane (VSM), syncytiotrophoblast (Sy), Hofbauer cell (HC), fetal blood vessel (FBV), maternal blood (MB), fetal blood vessel (FBV), trophoblastic layer (IMC), edema (E), loose
Figure (2): J- Placental calcification(40X); K- Chorangiosis (arrow head)(40X), L- Thickening of villi vessels (arrow head) and vessel thrombosis(40X), M- Present nucleated fetal RBCs(arrow head) (100X), N- Contained mature intermediate villi with continuous trophoblastic layer and edema in mature intermediate(40X), O- Edema in terminal villi(40X), P- Edema in stem villi (40X); calcification(CA), vessel thrombosis(Th), terminal villous(TV), edema(E), extravillous fibrosis, maternal blood(MB), fetal blood vessel(FBV), trophoblastic layer(TL), syncytial knot(K), fibrinoid necrosis(FN), extravillous fibrosis(EF).

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research  

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Analysis of Serum Uric Acid in Patients with Chronic Renal Impairment: A Research

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¹Al Muthanna University/Iraq

ABSTRACT

Two third of uric acid is excreted by kidneys. Therefore, it is expected for hyperuricaemia prevalence to increase in association with chronic renal impairment. Surveys had shown that hyperuricaemia is common in patients with chronic renal impairment. The present study aims to assess the prevalence of elevation in serum uric acid in patients with chronic renal impairment and their association with age, sex, hypertension, level of serum creatinine and duration of chronic renal impairment. Results show that the prevalence of hyperuricaemia is 75%, 76% of males and 74% of females and in about 50% of them serum uric acid is below 9 mg/dl. 84% of hyperuricaemic patients with chronic renal impairment among males are hypertensive, while 75% of hyperuricaemic patients in females are hypertensive. Statistical analysis showed significant association of hyperuricaemia with age and level of serum creatinine, but no sex difference. Can be concluded that the Hyperuricaemia is a common finding in patients with chronic renal impairment of both sexes, and it is well associated with age, level of serum creatinine and hypertension.

KEYWORDS: uric acid, hyperuricaemia, chronic renal impairment.

INTRODUCTION

Uric acid is generated by xanthine dehydrogenase or xanthine oxidase during the degradation of purines (1). Uric acid is derived from three sources: catabolism of ingested nucleoproteins, catabolism of endogenous nucleoproteins, and direct transformation of endogenous purine nucleotides (2).

Because of progressive loss of glomerular filtration rate (GFR), patients with chronic renal impairment have low renal clearance of uric acid and thus greater serum uric acid level than the general population. Approximately two thirds of uric acid is excreted by the kidneys, and the rest is excreted by the gastrointestinal tract; so the gastrointestinal route of elimination may be the major mechanism for excretion in the setting of renal failure (3). In addition, some uric acid is degraded in the body after reaction with oxidants or peroxynitrite (4).

The renal handling of uric acid is complex and is best described as a four component model that includes: glomerular filtration, proximal tubular reabsorption, tubular secretion, and post-secretary reabsorption (2,5).

Hyperuricaemia is most logically defined as a serum uric acid level above the theoretical solubility of monosodium urate monohydrate (MSUM) in physiological conditions { (0.42 mmol/l) or (7.0 mg/dl)} in male and

{ (0.36 mmol/l) or (6.0 mg/dl)} in female (6).

Asymptomatic hyperuricaemia is a state in which serum uric acid is abnormally high, but neither signs nor symptoms of uric acid deposition have occurred (7). Persistent hyperuricaemia occurs as a result of either excessive uric acid production, diminished renal excretion, or both (8).

Furthermore, hyperuricaemia is associated with a number of common chronic disorders (such as hypertension, hyperlipidemia, obesity, atherosclerosis and alcohol abuse), there is no definite evidence that uric acid acts as a causal factor in these setting (9,10). These observations have suggested that hyperuricaemia is not a disease (11).

However, the list of conditions associated with hyperuricaemia is expanding to include: diabetes mellitus, metabolic syndrome, hypothyroidism, acute
illness, pregnancy, preeclampsia and toxemia of pregnancy) (12).

Moreover, there is now compelling evidence that hyperuricaemia is an independent risk factor for chronic kidney diseases in general population (2,13), and in one study, risk was greater than for the presence of proteinuria (14). Additional evidence that hyperuricaemia may have a role in kidney disease was provided by a recent prospective clinical trial in which Allopurinol therapy was associated with significant slowing of renal disease progression in subjects with hyperuricaemia and renal insufficiency (15).

In another study they concluded a J-shaped association between uric acid level and all causes of mortality in patients with stage 5 on renal replacement therapy CKD (16).

The mechanism by which uric acid can cause renal disease was shown to be due to uric acid – induced endothelial dysfunction (17,18), activation of renin – angiotensin system (19), the development of glomerular hypertension and renal vasoconstriction (20).

Others found that uric acid suppresses 1 alpha-hydroxylase activity and synthesis of 1,25-dihydroxycholecalciferol, and that short-term administration of allopurinol suppresses serum uric acid and increases plasma 1,25-dihydroxycholecalciferol in patients with chronic mild to moderate renal impairment (21).

Other evidence supports a role for uric acid elevation as a true cardiovascular risk factor, particularly for the development of hypertension and renal disease (22). Aim of the Study was To detect the prevalence of hyperuricaemia in patients with chronic renal impairment and its relation to age and sex. Also Signify the association of hyperuricaemia with hypertension in patients with chronic renal failure. And Describe the relationship between hyperuricaemia and serum creatinine level and duration of chronic renal impairment.

**METHODOLOGY**

About 100 patients with chronic renal impairment were studied between January 2017 to June 2018. Study population consisting of 50 male and 50 female patients with different causes of chronic renal impairment. Age range was 14 to 70 years. Patients had different durations of chronic renal impairment ranging from 1 to 15 years. The Inclusion criteria were:

- Patients with chronic renal impairment confirmed by:
  - Ultrasonography (small size kidney).
  - Creatinine values (creatinine > 2 mg/dl).
  - Clinical features of uraemia of more than 6 months duration.

Each patient was interviewed. History, examination, vital signs were recorded. Investigations were done and the duration of chronic renal impairment was reviewed carefully because most of patients had no histopathological examination of kidney biopsy. Drug history was reviewed to exclude patients on Allopurinol therapy. All sample were collected according to ethical approval of ministry of environment and health in Iraq.

Investigations such as serum uric acid, blood urea, serum creatinine and random blood sugar were done at private clinic laboratories, just prior to dialysis sessions (for the patients on dialysis program).

**RESULTS**

Prevalence and Sex distribution of hyperuricemia, the prevalence of hyperuricemia was 75% (serum uric acid >7.0 mg/dl (or 420 mmol/l) in males and >6.0 (or 0.36 mmol/l mg/dl) in females), Statistically it was significant P < 0.01.
Statistically it was significant $P < 0.01$

**Figure (2)**: Sex distribution of hyperuricaemia in patients with chronic renal impairment

It was found that more than 50% of hyperuricemic patients have uric acid below 9 mg/dl, $P < 0.05$.

Relation of hyperuricaemia to duration of chronic renal failure. The prevalence of hyperuricaemia was found to be poorly related to the duration of chronic renal impairment, Table (1):

<table>
<thead>
<tr>
<th>Duration in years</th>
<th>1-1.9</th>
<th>2-2.9</th>
<th>3-3.9</th>
<th>4-4.9</th>
<th>$\geq 5$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperuricemic</td>
<td>18</td>
<td>90%</td>
<td>7</td>
<td>53.80%</td>
<td>7</td>
</tr>
<tr>
<td>Normouricemic</td>
<td>2</td>
<td>10%</td>
<td>6</td>
<td>46.20%</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
<td>13</td>
<td>100%</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperuricemic</td>
<td>12</td>
<td>75%</td>
<td>10</td>
<td>71.40%</td>
<td>3</td>
</tr>
<tr>
<td>Normouricemic</td>
<td>4</td>
<td>25%</td>
<td>4</td>
<td>28.60%</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100%</td>
<td>14</td>
<td>100%</td>
<td>7</td>
</tr>
</tbody>
</table>

Statistically it was not significant, $P$ value $> 0.5$.

Relation of hyperuricemia to serum creatinine level: It was found that the serum uric acid is directly related to serum creatinine,
The prevalence of hyperuricaemia was 75%. This can be explained by several probable mechanisms that account for the increment in uric acid levels in patients with chronic kidney diseases (CKD). First, the increment in uric acid level could be a secondary consequence of renal insufficiency, two-third of uric acid normally is excreted largely by the kidneys (3,24) and despite a compensatory increase in excretion through the gastrointestinal tract with progressive renal insufficiency, some retention is expected to occur (3,29). Secondly, the majority of patients were receiving diuretics, which also increase uric acid level. There also is an association of hyperuricaemia with hypertension and metabolic syndrome, both conditions with increased frequency in patients with chronic kidney diseases (CKD). Finally, hyperuricaemia may also complicate lead-associated renal diseases, which is being recognized increasingly as a significant cause of chronic kidney diseases CKD (35).

Normal adult male value of uric acid exceed those in women of reproductive age due to an enhancing effect of estrogenic compound on renal urate clearance (23). In chronic renal impairment, the urate clearance is affected by pathological process. Hence, this may be the cause that there is insignificant difference in the prevalence of hyperuricaemia between male or female.

The association of hyperuricaemia in general population with increasing age is well known (9), but the association of hyperuricaemia secondary to renal disease with increasing age may reflect the accumulative incidences with increasing age.

The poor relation of hyperuricaemia to the duration of chronic renal impairment may be explained by difference in progression rate due to different causes, initiation of treatment and different forms of dialysis, the complexity of renal handling of uric acid (5,24) and the adaptation of kidney (25).

The direct relation to the increment of uric acid to increased creatinine was compatible with Ohno I. Etal study which showed that serum uric acid is negatively related to the creatinine clearance (26).

About 80% of hypertensive patient with CRF were hyperuricaemic. Although, it has been seen that 25% of untreated hypertension are hyperuricaemic (27) This hyperuricaemia increases to 40% with the use of diuretic therapy, reaching up to 75% in the presence of reduced renal function (9).

Hyperuricaemia was reported to be an independent risk factor for renal progression in patients with glomerular diseases (29,30) and also may lead to increased risk in subjects with hypertension (31). In the days before uric acid – experimental hyperuricaemia in animals was shown to not only cause chronic kidney diseases CKD (33), but also accelerate chronic kidney diseases CKD from other causes (19).

There is little rational in treating asymptomatic hyperuricaemia, particularly if they are due to treatment with diuretics (32), unless there is a strong family history of gout, urolithiasis, persistently very high level (> 600 mmol/l (10.1mg/dl) or 780 mmol/l (13.1 mg/dl) in
patients with chronic renal failure \(^{33,34}\), or for prevention of uric acid nephropathy during cytotoxic therapy \(^{34}\).

Conclusion This study showed that Hyperuricaemia is directly related to increasing age and serum creatinine level, but it is poorly related to the duration of chronic renal impairment. There is significant association between hyperuricaemia and hypertension in patients with chronic renal impairment.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ministry of higher education and scientific research

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**REFERENCES**


Multiplex PCR Targeting Mitochondrial DNA to Identify Local and Imported Meat Species in Al-Diwaniyah City, Iraq

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¹Department of Public Health, ²Unit of Zoonotic Disease Research, College of Veterinary Medicine, University of Al-Qadisiyah, Diwaniyah, Iraq

ABSTRACT

The present study was designed to identify animal source of meat which used for human consumption in Al-Diwaniyah city, Iraq. For this reason, 74 local and imported-meat samples were collected from different stores and retailers in the city throughout one-year period, 2015-2016. A one-reaction multiplex PCR (mPCR) technique was recruited to distinguish five meat sources, beef, lamb, goat, donkey, and pork. The technique principle was based on the amplification of mitochondrial DNA (mtDNA). The results have shown accurate identification of animal source of the meat in which mixing of ground beef and lamb meat was detected in samples collected from local shops and retailers. All imported ground and whole-meat samples were positive for beef. In conclusion, mPCR method could be useful for easy and rapid detection of animal source of meat sold for human consumption to control commercial fraud.

Keywords: multiplex PCR, local and imported meat, DNA.

INTRODUCTION

Identification the animal source of meat sold for human consumption in markets is very important issue to control commercial fraud of meat products which concerns the consumers¹². For various reasons such as good health, religious, and market fraud, Rapid detection of meat adulteration is very important process³⁴⁵. In order to supply people with the desired meat products with no fraud, the researchers are responsible of finding and developing new tools to fulfill the above aim and testing meat products in the markets⁶⁷⁸. There are many methods that could be utilized to detect the animal species of meat such as sensory analysis, anatomical feature differences, histological characteristic variations, tissue fat properties, muscle glycogen level, and species-specific protein biomarker identification by DNA hybridization and electrophoresis⁹¹⁰¹¹. However, the DNA amplification based techniques such as polymerase chain reaction (PCR) is one simple, fast, sensitive, and specific method of choice that could identify the species of meat even after different meat processing¹²¹³. Using PCR targeting mitochondria DNA (mtDNA) of cytochrome b gene has the ability to detect and distinguish between animal species of meat¹⁴¹⁵. In the present study, we used multiplex Polymerase Chain Reaction (mPCR) to identify different meat species, beef, lamb, goat, donkey, and pork, by design species-specific primers based on mitochondria DNA cytochrome b gene. The method provided rapid detection of meat species from local and imported frozen ground and whole-meat samples.

MATERIALS AND METHOD

Meat samples collection: In this study, 74 Meat samples were collected during one-year period, 2015-2016, from different markets in Al-Diwania city, Iraq. The samples included 10 Iraqi commercial brand companies that import meat products from India and Brazil (Rayat Karbala, Alanna, Alfarher, Khairat Karbala, Anwar Karbala, Almurad, Alkafeel, Alwakeel, Alahmed, and Albayader). Other meat samples were collected from five different local markets in Al-Diwnia city. After collecting the samples, small pieces of meat samples were placed in 25ml sterile tubes, transported to laboratory, and stored in a refrigerator until used for genomic DNA extraction.

DNA extraction

The meat samples were subjected to tissue DNA extraction using a commercial DNA extraction kit.
Multiplex PCR technique (mPCR)

MPCR technique was used for detecting five meat species (beef, lamb, goat, donkey, and pork) that was based on the amplification of mtDNA cytochrome b gene.

**Primer**: The PCR primers were designed in this study using NCBI Gene sequence database and Primer 3 plus (beef: KJ789953.1, lamb: NC_001941.1, goat: KM360063.1, donkey: NC_001788.1, and Pork: NC_012095.1). These primers were provided by Bioneer, Korea as shown in table (1).

**PCR master mix preparation**: the mix was prepared using (Accu-Power® MPCR-PreMix-Kit). The master mix was produced depending on the manufacturer instructions as demonstrated in table (2). The thermocycler conditions used are shown in table (3).

**MPCR product analysis**: The mPCR products were examined by electrophoresis in a 1% agarose gel using 1X TBE buffer and stained with ethidium bromide. The gel was finally tested using UV transilluminator.

Table 1: mPCR primers with their sequences and amplicons

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence (5'-3')</th>
<th>Amplicon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>CTAGGCCTGTCCCTACTGGT</td>
<td>171bp</td>
</tr>
<tr>
<td>R</td>
<td>GCAAGCTGTGAAGTGTGGTG</td>
<td></td>
</tr>
<tr>
<td>Bovine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>GGAACAGGCTGAACCGTGTA</td>
<td>248bp</td>
</tr>
<tr>
<td>R</td>
<td>CCGGCTGCTAATACAGGGAG</td>
<td></td>
</tr>
<tr>
<td>Goat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>TGAGGGGCAACACGTCATCAC</td>
<td>342bp</td>
</tr>
<tr>
<td>R</td>
<td>GTCTGGGTCTCCGAGTAGGT</td>
<td></td>
</tr>
<tr>
<td>Donkey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>TTCTGAGTGCCCCAGTCAC</td>
<td>439</td>
</tr>
<tr>
<td>R</td>
<td>CTGATAGTGGAGGGAGGCCT</td>
<td></td>
</tr>
<tr>
<td>Pig</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>GCCTGGTGATAGCTGGTTGT</td>
<td>571bp</td>
</tr>
<tr>
<td>R</td>
<td>GAATACCGCGGCGTTAACC</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: The manufacturer instructions of the mPCR master mix

<table>
<thead>
<tr>
<th>Multiplex reaction mix</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNA template</td>
<td>5 µl</td>
</tr>
<tr>
<td>Forward primers 10 pmol</td>
<td>1 µl/primer</td>
</tr>
<tr>
<td>(Sheep, bovine, goat, donkey, and pig)</td>
<td></td>
</tr>
<tr>
<td>Reverse primers 10 pmol</td>
<td>1 µl/primer</td>
</tr>
<tr>
<td>(Sheep, bovine, goat, donkey, and pig)</td>
<td></td>
</tr>
<tr>
<td>PCR water</td>
<td>5 µl</td>
</tr>
<tr>
<td>Total volume</td>
<td>20 µl</td>
</tr>
</tbody>
</table>
Table (3) mPCR thermocycler conditions

<table>
<thead>
<tr>
<th>PCR step</th>
<th>Temp. (C)</th>
<th>Time</th>
<th>Repeat cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial denaturation</td>
<td>95</td>
<td>5 min.</td>
<td>1</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95</td>
<td>30 sec.</td>
<td></td>
</tr>
<tr>
<td>Annealing</td>
<td>58</td>
<td>30 sec.</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>72</td>
<td>30 sec.</td>
<td></td>
</tr>
<tr>
<td>Final extension</td>
<td>72</td>
<td>5 min.</td>
<td>1</td>
</tr>
<tr>
<td>Hold</td>
<td>4</td>
<td>forever</td>
<td>-</td>
</tr>
</tbody>
</table>

RESULTS

The MPCR results have shown detection of the animal species of the meat with high accuracy based on the amplicon size produced of the mtDNA cytochrome b gene. The results reveal mixing of ground beef and lamb in some local market samples table (4) and figure 1, but all the imported ground and whole meat samples have declared that the meats were of bovine origins as revealed in table (5) and figure 2.

Table 4: MPCR results of local market meats in Diwanyia city

<table>
<thead>
<tr>
<th>Samples tested</th>
<th>Type of meat</th>
<th>Trade brands</th>
<th>Origin</th>
<th>MPCR results</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Minced meat</td>
<td>local market No.1</td>
<td>Slaughter house Iraq</td>
<td>Bovine</td>
</tr>
<tr>
<td>5</td>
<td>Minced meat</td>
<td>local market No.2</td>
<td>Slaughter house Iraq</td>
<td>Bovine+ Sheep</td>
</tr>
<tr>
<td>3</td>
<td>Minced meat</td>
<td>local market No.3</td>
<td>Slaughter house Iraq</td>
<td>Bovine</td>
</tr>
<tr>
<td>4</td>
<td>Minced meat</td>
<td>local market No.4</td>
<td>Slaughter house Iraq</td>
<td>Bovine+ Sheep</td>
</tr>
<tr>
<td>3</td>
<td>Minced meat</td>
<td>local market No.5</td>
<td>Slaughter house Iraq</td>
<td>Bovine+ Sheep</td>
</tr>
</tbody>
</table>

Figure 1: Agarose gel electrophoresis image that shows the PCR product analysis of mtDNA cytochrome b gene from DNA extracted from local market meat samples. M is the ladder (2000-100bp). Lane 1 and 3 are for local market samples that showed only positive bovine at 248bp-PCR product size. Lane 2, 4, and 5 are for local market samples which gave positive beef and lamb at 248bp- and 171bp-PCR product size.
Table 5: MPCR results of imported meats in Diwanyia city

<table>
<thead>
<tr>
<th>No. of tested samples</th>
<th>Type of meat</th>
<th>Trade brands</th>
<th>Origin</th>
<th>M-PCR result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Calf meat</td>
<td>Rayat Karbala</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>6</td>
<td>Buffalo meat</td>
<td>Alanna</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>6</td>
<td>Buffalo meat</td>
<td>Alfakher</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>4</td>
<td>Calf meat</td>
<td>Khairat Karbala</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>5</td>
<td>Calf meat</td>
<td>Anwar Karbala</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>4</td>
<td>Calf meat</td>
<td>Almurad</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>10</td>
<td>Calf meat</td>
<td>Alkafeel</td>
<td>Brazil</td>
<td>Bovine</td>
</tr>
<tr>
<td>5</td>
<td>Calf meat</td>
<td>Alwakeel</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>5</td>
<td>Calf meat</td>
<td>Alahmed</td>
<td>India</td>
<td>Bovine</td>
</tr>
<tr>
<td>6</td>
<td>Minced meat</td>
<td>Albayader</td>
<td>India</td>
<td>Bovine</td>
</tr>
</tbody>
</table>

Figure 2: Agarose gel electrophoresis image that shows the PCR product analysis of mtDNA cytochrome b gene from DNA extracted from imported meat samples. M is the ladder (2000-100bp). Lane 1 to 10 are (Rayat Karbala, Alanna, Alfakher, Khairat Karbala, Anwar Karbala, Almurad, Alkafeel, Alwakeel, Alahmed, and Albayader) respectively. All samples have shown positive bovine origin only at 248bp-PCR product size.

DISCUSSION

Identification of Animal species of meat is a very important process to public health that protects customers from commercial adulteration in meat products. Many detection methods of meat species were previously used in some studies which needed procedures with thorough steps and cost ineffective such as PCR-RFLP, Real-time PCR and capillary electrophoresis system. In contrast, Conventional polymerase chain reaction (PCR) method with species-specific primers is characterized by higher accuracy, specificity, higher sensitivity, and relatively taking less time to perform the test; however it detects only few species. For these reasons, it is very necessary to use an effective and reliable molecular method to detect multiple meat species at a time by using MPCR technique. This technique is conducted at one-reaction mix and based on designing multiple species-specific primers that targets mtDNA cytochrome b gene.
Using mtDNA based approaches for detecting animal species of meat has been reported by several studies due to the large amount of mtDNA in cells. Moreover, mtDNA has high variability that allows precise identification of species\textsuperscript{17,18}. Another advantage of mtDNA is that it could be used to detect meat species even in cooked and highly processed meat without the need for DNA sequencing or digestion by restriction enzymes \textsuperscript{19,20}. Our results show that all imported meat samples are identical to one type of meat, and there is no mixing with other meat types. This may be due to the fact that most sources of these imported meats are owned by investors from Iraq who supervises these sources in the producing countries such as India and Brazil.

Whereas, the results of some local market ground meat samples showed mixing of bovine and lamb meats. This may be due to the origin of these meats from the local slaughter house that are sold directly to the consumers by the butchers that may have mixed the beef with lamb meats during preparing of ground meats. Other studies had shown mixing of donkey or horse meat, and the differentiation between horse and donkey meats is challenging because the high homology degree between both species sequences \textsuperscript{20}. In conclusion, MPCR technique is an effective, easy, and rapid molecular tool to identify multiple animal species of meat for controlling the adulteration in meats.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ministry of higher education and scientific research

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**REFERENCES**


Intra-Peritoneal Normal Saline Installation Minimize Post Laparoscopic Cholecystectomy Shoulder Pain in Patient Admitted to Diwaniya Teaching Hospital

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ABSTRACT

Although laparoscopic cholecystectomy significantly reduce post-operative morbidity still post-operative shoulder pain is relatively a problem in most of the patients.

Objective: To evaluate the efficacy of intraperitoneal instillation of normal saline in minimization of post-operative shoulder pain.

Patients and methods: This was a prospective study in which 200 patients underwent laparoscopic cholecystectomy in Diwaniya teaching hospital were randomly divided to two groups. In the group A: no intraperitoneal instillation of normal saline was used .In the group B: intraperitoneal instillation of normal saline under the right hemidiaphragm few minutes following the completion of operation with aspiration at the end of operation . Postoperatively shoulder pain score was registered on a visual analogue scale during 2,6,12 hours postoperatively and any additional analgesic requirements were registered.

Results: Shoulder pain score revealed a significant decrease in group B versus controls A at 2,6,12 hours postoperatively.

Conclusion: Intraperitoneal instillation of normal saline minimize postoperative shoulder pain in laparoscopic cholecystectomy.

Keywords: laparoscopic cholecystectomy, shoulder pain.

INTRODUCTION

Laparoscopic procedures, compared with laparotomies, are associated with lower morbidity, shorter hospitalizations, smaller incisions, earlier return to normal activity, and less postoperative pain. For the patients benefit, reduced postoperative pain is one of the greatest advantages of laparoscopy compared with open surgery¹,².

Although pain at the surgical site is reduced and hastens recovery, still the pain is not completely abolished after laparoscopy and the patient frequently describes right upper abdominal pain and shoulder pain in addition to the discomfort of port-site incisions. Some authors reported that 80% of patients require opioid analgesia after laparoscopic surgery³,⁴. There are several reasons why there is still room for surgeons to improve management of post laparoscopy pain.

First; better pain control would magnify the other advantages of laparoscopy in terms of earlier discharge and recovery time.

Second; surgeons may enjoy the satisfaction of less postoperative pain than they noticed formerly with open surgery, and of not needing to identify pain as an issue.
requiring further attention.

Third; it is commonly believed that reduced postoperative pain after laparoscopy comes from smaller size of incisions. However, there is evidence\(^{(5)}\) to suggest that the main source of pain after laparoscopy is from the peritoneum rather than skin or abdominal wall and the surgeons perception of post laparoscopy pain may be masked by the current tendency for the patients to be discharged after a short hospital stay. Pain after laparoscopic cholecystectomy may be moderate or even severe for some patients. The frequency of shoulder pain after operative laparoscopy is about (35%-60\%)\(^{(5)}\). The proposed etiology for postlaparoscopy pain is multifactorial and treatment of any factor in separately may not achieve the desired result. However, the surgeon is in a unique position to manage many of the causes by relatively minor changes in the technique, with corresponding additive improvements in outcome.

The proposed causes include\(^{(6)}\):

1. Distension of abdomen will induce neuropraxia, damage irritation of the phrenic nerves.
2. Irritation of peritoneum and diaphragm due to pus or blood in the peritoneal cavity may lead to pain.
3. The excessive traction of the triangular ligament during the operation and creation of space between liver and the diaphragm leading to loss of suction support of the heavy liver.
4. High pressure pneumoperitoneum.
5. Humidity (dry gas will cause more pain) and the volume of the insufflated gas (larger volume will cause more pain).
7. Sociocultural and individual factors.

A number of studies have looked at methods to reduce the incidence and severity of shoulder pain following laparoscopic surgery. Methods used include: pre-emptive non-steroidal anti-inflammatory medication\(^{(7,8)}\), low-pressure insufflation\(^{(9)}\), slow rate of insufflation\(^{(10)}\), no CO2 insufflation (gasless laparoscopy) by device to lifting the abdominal wall, Warmed gas and different gas as CO2 and nitrogen oxide (N2O)\(^{(10)}\), sub-diaphragmatic local anesthetic irrigation\(^{(11)}\), postoperative sub-diaphragmatic suction, removal of CO2 by means of Trendelenburg position (30 degrees)\(^{(12)}\) and a pulmonary recruitment maneuver consisting of five manual inflations of the lung\(^{(13)}\), infiltration of local anesthetics into the periporal parietal peritoneum, instillation into the gallbladder bed\(^{(14)}\), postoperative sub-diaphragmatic suction\(^{(15)}\).

Studies have often showed quite varied and sometimes conflicting results regarding the effectiveness of these interventions. This may be related to the variety of procedures performed and a wide variety of study methodologies used. Carbon dioxide (CO2) insufflation constitutes the commonest mean of creating the pneumoperitoneum. After laparoscopy CO2 gas remains within the peritoneal cavity for few Days (2-3 days) causing variable degrees of pain during this period, particularly soon after starting of activities and ambulation.

**PATIENTS AND METHOD**

This prospective study was achieved in Diwaniyah Teaching Hospital between October 2014 to October 2015. It includes 200 adult patients with symptomatic calculus gall stone underwent an elective laparoscopic cholecystectomy, gave their verbal acceptance to participate in this study. Patients were excluded from study when the operation was converted to an open procedure. Patients were assigned into two groups of 100 patients each:

**Group A:** served as a control and no intraperitoneal instillation of normal saline.

**Group B:** patient with intraperitoneal normal saline installation of about 1000 cubic centimeter at a temperature of 37°C, installed under the right diaphragm and the liver was submerged with the patient in a 30 degree Trendelenburg position. The fluid was aspirated during the CO2 deflation. The operations were done under general anesthesia and establishment of CO2 pneumoperitoneum via the blind insertion of a versus needle, four incisions were made for trocars insertion. Two were 10mm and two were 5mm. After CO2 evacuation at end of operation the trocar incisions closed. No infiltration of the wound by local anesthetic agent was done.

Intrabdominal pressure was automatically maintained at 12 mmHg by a CO2 insufflator. All patients received analgesics according to a standard postoperative...
protocol with Acetaminophen (paracetamol) 500mg intramuscularly (I.M.) \ intravenously (I.V.) 1 hour postoperatively and in the evening of the same day for the first 24 hours. Any additional analgesia Diclofenac 75mg I.M. or Tramadol hydrochloride ampule 50mg (I.M.) which was given on patients need in the ward were recorded.

Post operively all patients were assessed by the data collector who’s recorded the following:

1. Shoulder pain scores at 2, 6, 12 hours.
2. The analgesic medication usage postoperatively.
4. Vomiting postoperatively.

The pain score were recorded according to a horizontal 10 cm visual analogue scale (VAS) which had been introduced preoperatively to the patients as shown below*, were at 0 there is no pain, pain intensity score from 1-2 grade there is mild pain, from a 3-7 there is a moderate pain (which described as discomforting or distressing pain) and from 8-10 there is severe pain (which describe as a horrible or excruciating pain).

*visual analogue scale (Wong Baker Face Scale):

![Wong Baker Face Scale]

All data were analyzed using the statistical package for social sciences, 24, paired t-test used to compare scores at pre and post-operative, level of significance was set 0.05 as a cutoff point.

RESULTS

Demographic data were comparable between two groups of patients (table 1) the mean of age, sex and weight were not significantly different statistically.

Shoulder pain statistically in (table 2) show significant difference for group B versus A during the period 2, 6, 12 hours. With P-value = 0.03 for group B versus A

Nausea and vomiting occur in both groups but it was higher for the group A. The lowest incidence of nausea and vomiting was observed in group B patients as shown in (table 3). The number of patients who did not need additional analgesia were more in group B (table 4).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>48.2</td>
<td>47.5</td>
</tr>
<tr>
<td>Sex (male: female)</td>
<td>30/70</td>
<td>24/76</td>
</tr>
<tr>
<td>Weight</td>
<td>87.4</td>
<td>84.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>2 hour</th>
<th>6 hour</th>
<th>12 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (100)</td>
<td>5.5 (68%)</td>
<td>4.5 (52%)</td>
<td>3.8 (43%)</td>
</tr>
<tr>
<td>B (100)</td>
<td>3.5 (41%)</td>
<td>2.3 (30%)</td>
<td>1.8 (22%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
<td>37 (37%)</td>
<td>19 (19%)</td>
</tr>
<tr>
<td>Repeated vomiting</td>
<td>42 (66.6%)</td>
<td>23 (23%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients who did not need additional analgesia</td>
<td>34 (34%)</td>
<td>71 (71%)</td>
</tr>
<tr>
<td>Shoulder pain score range</td>
<td>2-7</td>
<td>0-4</td>
</tr>
</tbody>
</table>

DISCUSSION

The result of our study confirmed those of previous studies\(^{4,16-19}\). That shoulder pain after laparoscopy affect many patient especially in early hours.
Perry and Trombello\textsuperscript{(17)} were the first to find that intraperitoneal infusion of normal saline could reduce postoperative shoulder pain. The operative time was longer in group B as in other studies\textsuperscript{(4,16)} due to requirement of additional procedure including:

1-infusion of interaperitoneal normal saline.

2-changing in patient body position.

3-suction of fluid.

Ridell and Semn\textsuperscript{(18)} showed that the CO2 gas was present in a sub diaphragmatic region after laparoscopy and it remain more than 24 hours. In this study we infuse certain amount of normal saline (1 liter) into right hemidiaphragmatic area in order to replace and reduce CO2 between liver and the diaphragm with decrease the intraperitoneal CO2 by formation of hydrocarbonic acid then aspiration of fluid reduces the space between the liver and the diaphragm for complete return of liver to be in contact with the diaphragm. We place the patients at 30 degree Trendelenburg position as in other studies\textsuperscript{(4,16,17)} in order to allow as to infuse a minimum amount of normal saline to eliminate gas space between liver and diaphragm.

There is individuals variation regarding the size and shape of the liver. We believe that mobilization increases traction on the peritoneal reflections of the heavy viscera, which loss suction support for their weight owing to the creation of peritoneal spaces by gas thereby delay absorption of the peritoneal gas\textsuperscript{(16)}.

In this study normal saline infusion significantly reduce shoulder pain as in other study\textsuperscript{(4,16,17,19)}. In this study the percentage of patients in group B who did not need additional analgesia were about the same as in other study\textsuperscript{(16)} In this study nausea and vomiting postoperatively were reduced by normal saline irrigation while in other study\textsuperscript{(14)} who use local anesthetic agent for intraperitoneal irrigation the incidence did not changed.

**CONCLUSIONS**

The most important cause for shoulder pain was residual CO2 in peritoneal cavity during laparoscopic cholecystectomy. The sub diaphragmatic instillation of normal saline until the liver is submerged will replace the CO2 between the liver and diaphragm and help to recontact the liver to the diaphragm and this leads to decrease diaphragmatic irritation. Decrease in the exposure of internal organs to external contaminants with lesser irritation. The use of intraperitoneal normal saline instillation will eliminate these factors resulting in a significant minimization in postoperative shoulder pain, nausea, vomiting and in the requirement for further analgesic medication for shoulder pain. We recommend the use of sub-diaphragmatic normal saline instillation routinely in all cases of laparoscopic cholecystectomy

**Ethical Clearance:** All subjects in this study were taken written consent before participation in this study according to ethical approval of ministry of health and environment in Iraq.

**Conflict of Interest:** None

**Source of Funding:** Self

**REFERENCES**


Association of Vitamin-D receptor gene polymorphisms (FokI and ApaI) and vitamin D Serum Levels in a sample of Iraqi Women with Polycystic Ovary Syndrome

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¹College of medicine Al-Mustansiryia University/Iraq,²Dept.of biotechnology, College of science, Baghdad University/Iraq

ABSTRACT

The Affected women with polycystic ovary syndrome (PCOS) usually suffer disturbances in their metabolism one of these disturbance is increase insulin resistant, which may play a role in vitamin D metabolism. This study aimed to find an association between the VDR (vitamin D receptor) FokI and ApaI gene variant in exon 2 and intron 8 with metabolic and endocrine parameters in obese PCOS women. A case control study include 200 women ,age from 18 to 40 years divided between control (non PCOS, non-obese) and obese PCOS, Genotypes of FokI-I and Apa-I polymorphism of VDR gene were determined using the PCR-RFLP(polymerase chain reaction-restriction fragment length polymorphism). The mean serum 25 hydroxyvitamin D and calcium levels in PCOS women were significantly lower than the control 17.2±2.33 ng/ml , 31.2±3.39 ng/ml for vitamin D and 7.36±1.04mg/dl , 8.91±0.91mg/dl for calcium respectively, AA genotype distribution of the VDR Apa-I SNP (single nucleotide polymorphism) in PCOS was significantly higher than control (60% versus 40%) ,and it was associated with lower levels of vitamin D status and androstenedione in PCOS in comparison to aa genotype which associated with normal status. FF genotype of the VDR FokI was more frequent observed in PCOS than control and it was associated with lower levels of vitamin D status and androstenedione in PCOS in comparison to ff genotype which associated with normal status. Can be concluded from present study that Hypovitaminism D was more frequent observed in obese PCOS. The FokI-I and Apa-I polymorphism of the VDR gene is associated with PCOS.

Keywords: SNP, PCOS, vitamin D receptor, vitamin-D

INTRODUCTION

PCOS affects around 6-20% of women in reproductive age¹. Diagnostic criteria for PCOS require two out of three of Rotterdam diagnostic criteria, polycystic ovary syndrome is a complex endocrine condition in which ovulatory dysfunction and androgen excess are cardinal features (³).Affected women are at increased risk of hyperinsulinemia ,insulin resistance (IR),and other health hazard (⁴).Clinical reviews have demonstrated a constructive relationship between flowing vitamin D(25-hydroxyvitamin D) levels and insulin affectability (⁵).The role of gene variants of VDR (vitamin D receptor)and vitamin D level related variants with PCOS has been reviewed by many authors (⁶) .some of them demonstrate a correlation between vitamin D deficiency and the pathogenesis of metabolic syndrome (MS) in PCOS⁷. Vitamin D regulate calcium homeostatic and calcium plays a role in oocyte retrieval as well as oocyte maturation resulting in the gradual progression of follicular development (⁸).This study aimed to investigate the correlation between VDR variants , FokI-I and Apa-I with different parameters like 25(OH)D levels in Iraqi obese PCOS women. Additionally, we examined if there is any associations with PCOS susceptibility.

MATERIALS AND METHOD

The present study was enrolled at College of Science and AL-Yarmouk Teaching Hospital, Baghdad, Iraq during the period of April 2016 to April 2017. Research Ethics Committee approved the study that involved 100 obese women with PCOS (cases) diagnosed based on Rotterdam criteria and 100 women to serve as
controls without evidence of PCOS and with no thyroid dysfunction and they were not obese. All cases and controls were genetically unrelated. Diagnosis of PCOS was basis of the Rotterdam criteria\(^{(2)}\). Patients with congenital adrenal hyperplasia, Cushing’s syndrome, cases with vitamin D supplementation or any treatment might affect calcium homeostasis were excluded. Verbal consent was taken from all women all sample were collected according to ethical approval of ministry of environment and health in Iraq. 10 ml of blood was collected with EDTA-containing tubes for isolation of genomic DNA by standard method and the other part collected without anticoagulant and centrifuged at 1500xg to obtain serum used in biochemical measurements which include the following calcium, Insulin, Vitamin D, LH, FSH, testosterone, DHEAS (dehydroepiandrosterone sulphate), androstenedione were measured using a commercially available ELISA kits. A fasting 75g oral glucose tolerance test was done for all women in the study. Blood samples were drawn after 30, 60 and 120 minutes for glucose and insulin determination. Insulin resistance (IR) was estimated using the HOMA-IR (homeostatic model assessment-insulin resistance)

**VDR genotyping** : Regarding genotyping of SNPs: FokI (rs10735810), and ApaI (rs7975232) of VDR gene PCR-RFLP has been done. All PCR has been done in a Biometra thermal cycler, by using Taq Polymerase (Bioline). For VDR FokI polymorphism, PCR amplification was carried out in a total volume of 10 μL containing 50 ng of genomic DNA, 200 μmol/L dNTPs, 10 pmol of each primer, 1.5 mmole/L MgCl\(_2\), 0.5 U Taq polymerase as well as using 1 μL of 10× PCR buffer\(^{(9)}\).

The frequencies of VDR FokI gene variant were computed by direct counting regarding F and f alleles and FF, Ff, and ff genotypes in PCOS and controls groups and also for Apa I gene variant. The frequencies of alleles and genotype in both groups were calculated and compared by using a \(\chi^2\) test. The data had been examined in relation to their fitness to Hardy-Weinberg equilibrium (HWE).

The SPSS ver. 14.0 software and Microsoft Office Excel 2010 were used to calculate the \(\chi^2\) value, the odds ratio (OR), and 95% confidence interval (CI), t test was used for detection of differences between obese PCOS cases and controls regarding clinical characteristics. P value < 0.05 was considered statistically significant.

**RESULTS**

The clinical and biochemical characteristics of obese PCOS and non PCOS women was summarized in table 1. 100 obese PCOS women, 100 non obese healthy women as normal controls, their age ranged from 19 - 40 years. The mean age of obese PCOS women was, 27.96 ± 1.22 years, non-obese women control women was 26.86 ± 1.25. There was no statistically significant difference between two groups regarding age (p >0.05). But with respect to BMI (kg/m\(^2\)) there is statistically significant difference between obese PCOS women (mean ± SD, 27.96 ± 1.22) and controls (mean ± SD, 24.86±2.9) (p <0.05). PCOS women had a higher LH, LH/FSH and lower vitamin D and Ca levels in comparison with controls. On the other hand women in PCOS group have significantly increase in fasting insulin levels, insulin resistant, testosterone, androstenedione levels, also they had significantly lower vitamin D, which divided in to (30%) presented with vitamin D deficiency, vitamin D insufficiency was reported in 35%, sufficient vitamin D status was found in 35%. Vitamin D deficiency and vitamin D insufficiency were less frequent in control group as (85 %) had sufficient vitamin D status as shown in table 2

**Table 1: Anthropometric, Clinical and hormonal characteristics of obese PCOS and healthy control women.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Obese PCOS cases</th>
<th>Healthy control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>27.96±1.22</td>
<td>26.86±1.25</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>BMI(Kg/m(^2))</td>
<td>27.82 ± 3.14*</td>
<td>24.86±2.9</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Testosterone(ng/ml)</td>
<td>1.13±0.26**</td>
<td>0.55±0.11</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td>DHEAS(µg/L)</td>
<td>171±11.2</td>
<td>169±10.0</td>
<td>P&gt;0.05</td>
</tr>
</tbody>
</table>
Cont. Table 1: Anthropometric, Clinical and hormonal characteristics of obese PCOS and healthy control women.

<table>
<thead>
<tr>
<th></th>
<th>Number of PCOS</th>
<th>Number of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vit D ng/ml</td>
<td>17.2±2.33***</td>
<td>31.2±3.39</td>
</tr>
<tr>
<td>Calcium(mg/dl)</td>
<td>7.36±1.04**</td>
<td>8.91±0.91</td>
</tr>
<tr>
<td>Insulin(µU/L)</td>
<td>17.65±1.25**</td>
<td>11.29±1.29**</td>
</tr>
<tr>
<td>Androstenedione(ng/ml)</td>
<td>2.2±0.43**</td>
<td>1.6±0.63</td>
</tr>
<tr>
<td>HOMA – IR</td>
<td>2.49±0.31**</td>
<td>1.12±0.36</td>
</tr>
<tr>
<td>LH mlU/ml</td>
<td>8.21±1.35**</td>
<td>5.1±1.22</td>
</tr>
<tr>
<td>FSH mlU/ml</td>
<td>6.61±1.25</td>
<td>4.8±1.32</td>
</tr>
<tr>
<td>LH/FSH</td>
<td>1.44±0.22*</td>
<td>1.06±0.14</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SD .*Significant at 0.05 level with control group; **Significant at 0.01 level with control group. ***highly significant at 0.001 level

Table (2): Distribution of vitamin D status in study groups

<table>
<thead>
<tr>
<th>Vitamin D status</th>
<th>Number of PCOS</th>
<th>Number of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less 10 ng/ml severe deficiency</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>10-20 ng/ml moderate deficiency</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>20-30 ng/ml insufficient</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>Above 30 ng/ml sufficient</td>
<td>35</td>
<td>85</td>
</tr>
<tr>
<td>Total number of samples</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Odd ratio</td>
<td>10.52</td>
<td></td>
</tr>
<tr>
<td>95%CI</td>
<td>5.352-26.8</td>
<td></td>
</tr>
<tr>
<td>Significance level</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Polymerase chain reactions was performed for the VDR gene amplification in all women in this study. Agarose gel electrophoresis was used to confirm this amplification for each exon and intron following optimization experiment when sharp, single bands with the accurate molecular sizes were obtained for each exon and intron. Using specific primers the VDR gene was amplified for the detection of each FokI, and ApaI SNPs. The balance was usually achieved between reaction components to reduce the non-specific amplification or to enhance the desired DNA product yield. For this reason the PCR condition was optimized before starting. So in the PCR experiments the optimization of PCR conditions, that include annealing time and temperature was performed in each PCR experiment It was 68°C for 45 sec for VDR primers in this study. The reaction components were kept at the same concentrations. PCR negative control was performed in each experiment to determine any possible contamination and all negative control samples appeared as empty gel lanes in all experiments. The following figures demonstrate the amplified exons of VDR gene which are: exon 2 (figure 1), and intron 8 (figure 2). Amplification was achieved for all patients and controls. VDR Genotype polymorphisms are designated by the first letter of restriction enzymes name used for digestion. On the other hand a capital letter indicates the absence of the cut site, whereas its presence was indicated by a lower-case letter.
PCR- RFLP genotyping of VDR gene: The results of PCR-RFLP analysis of the FokI of the VDR gene for women in both groups are shown in figure (3) and table (3) which are summarised as the (FF), (Ff) and (ff) showed one band (265bp), three bands (265, 169, 96) bp, two bands (169, 96) bp respectively. The genetic polymorphism of VDR was determined at FokI site, which were presented with three genotypes (FF, Ff, ff) for FokI in PCOS patients and controls. The genotype FF of VDR gene at FokI position demonstrated a significant (P=0.045) increased percentage frequency in PCOS patients (50 percent) compared to controls (36 percent), while the distribution of Ff genotypes was 23% in PCOS group in comparison to 30% in control subjects. On the other hand, the distribution of ff genotypes was lower (27%) in PCOS patients in comparison with 34% in control women. The difference was significant (P<0.05). The F and f allele were significantly different in PCOS patients and control subjects (p<0.01). A significantly higher VDR FokI F allele in PCOS in comparison with FokI f allele, which was more common among the control group. These finding may have a positive role of F allele which seems to be a predisposing factor to PCOS in the Iraqi women and a protective effect for the f allele. In Figure (4) presented the results of PCR-RFLP analysis at the ApaI of the VDR gene which showed three genotypes: (AA), (Aa) and (aa). The first give one band (740) bp, while the second yielded three bands (740, 530, 210) bp and two bands (530, 210) bp, this genetic polymorphism in all obese PCOS patients and controls were detected. Results showed the AA genotype distribution were higher in the PCOS 60% versus controls 40% and P = 0.005, while the Aa genotype distribution were lower in the PCOS patients compared with controls but the difference is not significant (24 percent vs. 32 percent respectively, P =0.2). Results for aa genotype distribution were lower in the patients than controls but the difference is not significant (16 percent vs. 28 percent respectively, P =0.07. Both A and a alleles’ frequency were significantly different between PCOS patients in comparison with the controls (P<0.01). The VDR ApaI A allele significantly
frequent in PCOS women while the VDR Apa1 a allele was more frequent among the control group. These finding suggest a protective role for the a allele in contrast to the role of A allele which considered as a predisposing factor to PCOS in the Iraqi women.

**Table (3): Genotypic and allelic frequencies of VDR FokI in both groups.**

<table>
<thead>
<tr>
<th>Genotype or Allele</th>
<th>PCOS Patients (No.=100)</th>
<th>Controls (No.=100)</th>
<th>OR*</th>
<th>95 % CI</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>FF</td>
<td>50</td>
<td>50</td>
<td>36</td>
<td>36</td>
<td>1.77</td>
</tr>
<tr>
<td>Ff</td>
<td>30</td>
<td>23</td>
<td>30</td>
<td>30</td>
<td>0.69</td>
</tr>
<tr>
<td>Ff</td>
<td>20</td>
<td>27</td>
<td>34</td>
<td>34</td>
<td>0.46</td>
</tr>
<tr>
<td>F</td>
<td>130</td>
<td>65</td>
<td>102</td>
<td>51</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>70</td>
<td>35</td>
<td>98</td>
<td>49</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table (4): Genotypic and allelic frequencies of VDR Apa I in PCOS both groups.**

<table>
<thead>
<tr>
<th>Genotype or Allele</th>
<th>Obese PCOS Patients (No.=100)</th>
<th>Controls (No.=100)</th>
<th>OR*</th>
<th>95%CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>AA</td>
<td>60</td>
<td>60</td>
<td>40</td>
<td>40</td>
<td>2.25</td>
</tr>
<tr>
<td>Aa</td>
<td>24</td>
<td>24</td>
<td>32</td>
<td>32</td>
<td>0.67</td>
</tr>
<tr>
<td>Aa</td>
<td>16</td>
<td>16</td>
<td>28</td>
<td>28</td>
<td>0.52</td>
</tr>
<tr>
<td>A</td>
<td>144</td>
<td>72</td>
<td>112</td>
<td>56</td>
<td>1.08</td>
</tr>
<tr>
<td>A</td>
<td>92</td>
<td>38</td>
<td>88</td>
<td>44</td>
<td>0.92</td>
</tr>
</tbody>
</table>
Values are expressed as mean ± SD. *Significant at 0.05 level with control group; **Significant at 0.01 level with control group; ***highly significant at 0.001 level.

Data from Table 5 showed that FF genotype of VDR FokI were associated with significant alteration of vitamin D, calcium, androstenedione, LH and HOMA-IR values in obese PCOS Iraqi women in contrast with the ff genotype which associated with normal values of these metabolic parameters. This condition was noticed in AA genotype of VDR ApaI in obese PCOS women.
DISCUSSION

Genetic variants of the VDR gene are associated with insulin sensitivity and resistant and VDR Apa-I and FokI variants are affect calcium and testosterone levels in PCOS women. We observed positive correlation between vitamin D related polymorphisms and PCOS susceptibility the same result was reported by many investigators as they found that PCOS and its biochemical markers might be associated with VDR polymorphism (10,11). They analysis the variants that are located at the 3' end of the VDR gene such as , ApaI and Fok I. The present study investigated a significant association between the presence of the each of VDR ApaI A and FokI F alleles and obese PCOS patients, while the VDR ApaI a and FokI f allele were more frequent among the control individuals. Our results different with earlier data reported by other studies (6,10) which referred that the association was not reached the level of statistical significant both for the genotype frequency level or with clinical/biochemical traits, as well inconsistent with Dipanshu and his workers (9) who found that the FF allele was associated with PCOS in Indian population, however such association not established in Iranian women (12). In addition VDR gene Apal polymorphism, the AA genotype was associated with higher testosterone levels this result was in agreement to a previous study among Austrian women where they suggested that AA genotype was associated with higher testosterone levels (6). An observation that in which the AA genotype association and PCOS was clearly obtained. Another new finding in this work revealed a significant association between the presence of higher AA genotypes distribution and higher A allele frequency and PCOS, while aa genotypes distribution and a allele frequency are more common among control individuals. This result suggest that a allele might have a role in occurrence of PCOS and A allele may protect against PCOS in Iraqi women for the first time. The finding of this study was reinforce the association of the AA genotype with the susceptibility to the PCOS in addition to FF genotype yielded by FokI digestion of VDR gene in agreement with Mahmoudi who reported that variant Apa-I in VDR gene may be related with metabolic syndrome in women with PCOS (10). FF genotype distribution frequency was present with high testosterone levels. A theory behind this is that FokI F-allele carriers would have increase absorption of calcium from the gut, due to the increase protein expression this proteins are responsible for intestinal calcium channel, this process leading to increase Calcium fluxes and regulation of intracellular calcium stores and this may subsequently regulation of insulin secretion by the β-cells, this polymorphism possibly may affect the β-cell function in PCOS (13).

Finally, the findings of this work give an information on the association of VDR gene (Fok1 and Apa 1) polymorphisms with PCOS susceptibility in the Iraq women. However, the role of the VDR and vitamin D still needs to be established more clearly.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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Evaluation of Some Serum Biomarkers in Patients with Polycythemia Vera

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ABSTRACT

Background: Polycythemia vera (PV) is a hematopoietic disturbance involving uncontrolled proliferation of hematopoietic precursor cells. The disease usually accompanied by remarkable inflammatory and thrombotic disorders.

Aims: This case-control study aimed to measure levels of some inflammatory markers in serum from patients with PV.

Subjects and Method: The study recruited 30 patients with PV and other 30 age- and sex-matched family-unrelated healthy individuals. Blood samples were obtained from each participant, and levels of interleukin-6 (IL-6), interleukin-8 (IL-8), and C-reactive protein (CRP) in the serum were evaluated.

Results: PV patients showed significantly higher levels of IL-8 and CRP (71.13±11.4 pg/ml and 0.215 mg/L respectively) than controls (58.23±9.7pg/ml and 0.145 mg/L respectively. IL-6 levels did not show any significant variations between patients and controls (11.8±3.8 pg/ml vs 10.6±4.2 pg/ml).

Conclusion: The study indicates the importance of IL-8 and CRP as indicator for high levels of inflammatory events accompanied PV which may facilitate thrombotic events.

Keywords: polycythemia vera, C-reactive protein, IL-6, IL-8.

INTRODUCTION

Polycythemia simply means an excess of erythrocyte production. It is generally classified into vera, or so called primary or true polycythemia, and non-vera which is further subdivide into secondary and relative polycythemia. These letters are either attributed to oxygen deprivation (as in cases of chronic pulmonary and cyanotic heart diseases), or dehydration (as in cases of excessive sweating) [1].

PV is a disorder in hematopoietic stem cell involving an uncontrolled proliferation of a clone of hematopoietic precursors, and accordingly there will be an excessive production of erythrocytes, and platelets and leukocytes in some patients [2]. In 2016, World Health Organization (WHO) has revised the myeloid neoplasms classification and listed PV with chronic myeloid neoplasms [3]. PV is considered among relatively common hematologic malignancies [4]. It was estimated that there are 44-57 cases of PV for every 100,000 persons [5]. The disease is more frequent among men and elderly than women and younger ages [6].

As with other malignancies, the exact causes of PV are not exactly known; however, nearly 99% of PV patients have a Janus kinase 2;9p24 (JAK2) gene mutation. About 96% and 3% of those patients carry somatic mutation in exon 14 (called JAK2V617F) and in exon 12 of this gene, respectively [7,8].

Thrombosis is one of the most important complication of PV. Approximately one-fifth of the patients have an arterial or venous thrombotic events as prominent feature [9]. Data from earlier studies suggested that the probability of thrombosis in PV patients ranged between 11-39% which increases mortality rate among those patients [10]. Investigations for causes of tendency revealed large number of risk factors. [11]. However, the role of inflammation in this regards received less attention. Inflammation and hemostasis could be involved in a positive feedback loop, in that
inflammation induces thrombosis, which in turn could amplify inflammation. In fact, inflammation affects all cellular and humoral components of coagulation including platelets, vascular endothelial cells and the plasma coagulation cascade [11] [13]. Found that CRP, IL-6 and IL-10 were significantly linked with high risk of post-operative deep venous thrombosis in Brazilian patients with abdominal malignancies. Investigation the pre-inflammatory factors in PV patients could improve our understanding of thrombosis tendency in those patients. Therefore, this study aimed to measure the levels of three serum components (CRP, IL-6 and IL-8) in patients with PV and the association of these components with thrombosis.

MATERIALS AND METHOD

The Study Population

This case-control study involved 30 patients with PV who were attending Hematology Center/ Baghdad during the period from September 2015 to March 2016. Inclusion criteria were according to that revised by WHO for myeloproliferative neoplasms [3]. Exclusion criteria were the presence of any inflammatory conditions, renal or hepatic diseases, pregnancies, essential hypertension and diabetes. From each participant, about 5 ml of venous blood sample were obtained, from which serum was separated and kept at -20 C until be used. Both the technician taking blood samples and the analyzer were blinded to the study groups.

Serology

Commercial kits (Cusabio/China) were used to measure levels of human IL-6 and IL-8 according to the manufacturer’s manual. Briefly, 100µL of each serum sample were poured at each well of microtiter plate except wells ascertained for standards. An adhesive strip was used to cover the plate which was incubated for 2hrs at 37°C. After content removal and washing, 100µl/well of biotin-antibody were dispensed, and the plate was incubated and washed as previously, and 100µL of conjugate solution were added followed by incubation at RT for 5-10 min. Stop solution (100µL) was dispensed and the absorbance was read at 450nm. CRP concentration was determined according to a pre-constructed standard curve.

STATISTICS

All statistics were calculated using SPSS software (version 20). Data were analyzed for normal distribution according to Shapiro-Wilk test. Independent t-test was used to compare means of normally distributed variables, while variables with non-normally distribution were tested with Mann Whitney U test. Besides, Chi-square test was used to find out any significant differences between the two groups in term of gender and residence. A significant difference was determined as P≤0.05.

RESULTS

Table 1 shows the baseline characteristics of the study population. Only residence showed a significant difference between cases and controls where rural residences seemed to be more affected than urban residences (P=0.03).

Table 1: Baseline characteristics of the study population

<table>
<thead>
<tr>
<th>Variables</th>
<th>Primary polycythemia (30)</th>
<th>Controls (30)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) mean±SD</td>
<td>54.87±13.44</td>
<td>52.1±11.16</td>
<td>0.387</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13(43.33%)</td>
<td>16(53.33%)</td>
<td>0.606</td>
</tr>
<tr>
<td>Female</td>
<td>17(56.67%)</td>
<td>14(46.67%)</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>19 (63.33%)</td>
<td>27(90%)</td>
<td>0.030</td>
</tr>
<tr>
<td>Rural</td>
<td>11(36.67%)</td>
<td>3(10%)</td>
<td></td>
</tr>
</tbody>
</table>
PV patients showed higher serum levels of IL-8 than controls (71.13±11.4 pg/ml vs 58.23±9.7 pg/ml) with significant difference (P=0.026). On the other hand, levels of IL-6 were very close in patients and controls (11.8±3.8 pg/ml vs 10.6±4.2 pg/ml) with no significant difference (P=0.159) as shown in figure 1.

The median of serum concentration of CRP in PV patient was 0.215 mg/L (range 0.01 to 5.1 mg/L) and it was significantly higher than control which was 0.145 (range 0.01 to 3.76 mg/L) with significant difference (Mann Whitney U test= 264.00, P=0.033) as illustrated in figure 2.

**DISCUSSION**

The current study revealed a significant elevation in levels of IL-8 but not IL-6 in patients with PV compared to healthy controls. In fact, several previous studies indicated that PV is associated with an elevation of different chemokines and cytokines such as monocyte chemoattractant protein-1 (MCP-1) and hepatocyte growth factor (HGF), IL-4, II-6, IL-8, IL-11, interferon-gamma (IFN-γ), and tumor necrosis factor-alpha (TNF-α). The mechanisms by which these factors elevate are not well known. However, there are two main possible sources for such increase. Firstly, the increase in IL-8 producer cells. As IL-8 is mainly produced by macrophage and epithelial cells, it is less likely that these cells contribute in a significant increase in IL-8 in PV patients because these cells represent only small percentage of blood cells. Secondly, and the most reasonable cause, is the effect of JAK2V617F mutation. As the vast majority of PV patients are carrying JAK2V617F mutation, it is reasonable to assume that this mutation can be, at least partially, involved in the upregulation of gene expression of some cytokines and chemokines. JAK2 is a protein attaches to a kind of receptors called non-receptor tyrosine kinases (NRTKs) which are characterized by the absence of receptor-like features like the presence of an extracellular domain that binds ligands and a transmembrane-spanning region. However, for JAK2-associated receptors, they are anchored to the cell membrane through amino-terminal modification. At normal physiological circumstances, different factors (cytokines, chemokine’s, erythropoietin…etc) bind these receptors and induce a change in receptor confirmation which facilitates JAK’s approach to the receptor. The attached JAK2 molecule becomes phosphorylated and recruits signal-transducing molecule called STAT (Signal Transducer and Activator of Transcription) in the JAK/STAT signaling pathway, phosphorylation of STAT causes dimerization and moving into the nucleus of the cell where it recognizes specific promoter elements and attaches with. There, it either activates or suppresses gene transcription.

For IL-8, a previous study showed that activated STAT3 and nuclear factor kappa B cell activator (NFkB) were needed to induce the expression of this cytokine in adenocarcinoma cells. More recently, JAK 9 demonstrated that the activated STAT3 by JAK2 binds to interferon-gamma activated site (GAS) element in the IL-8 gene promoter and influences the cytokine transcription. On the other hand, there is no evidence for this effect of JAK2 activation on IL-6.

The current study showed significant increase in CRP in PV patients compared with healthy controls. These results are in agreement with that of who measured CRP in 244 PV Italian patients and found a significant increase in this protein especially in patients suffering from thrombosis. CRP is mainly produced by liver cells under the influence of inflammatory cytokines. Upon its release, CRP binds to FCγR family receptors which are expressed on many cells of the immune system and
certain pathogens \cite{21}. In a recent study, \cite{22} evaluated the serum levels of high sensitivity CRP in 172 Italian patients with PV. They demonstrated that these levels are independent on the JAK2V617F allele burden. Thus, it cannot attribute the significant increase in CRP in PV patients in the current study directly to the mutational profile of the patients. Most probably, this mutation causes an increase in some pro inflammatory cytokines which induce liver cells to increase CRP production.

These data indicate the importance of IL-8 and CRP as indicator for high levels of inflammatory events accompanied PV and could predispose for thrombosis. More studies with other inflammatory markers are required to delimit the inflammatory extend of PV in order to better control the deleterious sequellae of this malignancy. Also can be study the genetic levels and other parameters in patients with polycythemia vera\cite{23-28}.

**Ethical Clearance:** All subjects in this study were taken written consent before participation in this study according to ethical approval of ministry of health and environment in Iraq.

**Conflict of Interest:** None

**Source of Funding:** Self

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Serum N-Terminal pro Brain Natriuretic Peptide as Predictor of Left Ventricular Remodeling in Diabetic Subjects with Acute Coronary Syndrome

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ABSTRACT

Background: Atherothrombosis can no longer be considered a disease of the developed world, because myocardial infarction and stroke are increasingly prevalent worldwide. Insulin resistance and diabetes rank among the major cardiovascular risk factors, The level of BNP may reflect the size or severity of the ischemic insult, even when myocardial necrosis has not occurred.

Objective: To determine the level of serum NT-PRO brain natriuretic peptide which marked an increased incidence of cardiovascular events in unselected community-based individuals with diabetes mellitus and Acute coronary syndrome admitted to cardiology care unite within 24 hour.

Patients and Methods: Clinical, echocardiographic, and laboratory characteristics, including N-Terminal pro brain natriuretic peptide (NT-PRO BNP), troponin I (TnI), C-reactive protein (CRP), and Glucose were measured within 24 hours of hospitalization for 70 patients, they divided into two groups according to Blood glucose level (diabetic & non diabetic). Twenty healthy subjects were considered as control group. The present study was conducted at the Department of Bio Chemistry, College of Medicine, University of Baghdad and Baghdad Teaching Hospital during the period from April 2016 to April 2017.

Results: The patients with Acute coronary syndrome (A.C.S) were found to have significantly higher mean (± SEM) value of serum NT-PRO BNP as compared with mean (± SEM) value of serum control group (p<0.001).

The mean (± SEM) values of serum NT-PROBNP concentrations, hs-troponine I, hs-CRP, left atrium diameter and E/e were non significantly higher in diabetic group than non diabetic group, while mean (± SEM) values of isovolumic relaxation time and deceleration time were found non significantly higher in non diabetic group than in diabetic group. However, the mean (± SEM) value of ejection fraction was significantly higher in non diabetic group than in diabetic group, (P-value=0.0261).

Conclusions: A single measurement of NT-PROBNP on admission can predict early and degree of left ventricular remodeling in diabetic patients with Acute coronary syndrome.

Keywords: B-type natriuretic peptide, ACS, diabetes.

INTRODUCTION

Atherothrombosis can no longer be considered a disease of the developed world, because myocardial infarction and stroke are increasingly prevalent worldwide, across all socioeconomic strata. By 2025, cardiovascular mortality on a worldwide scale will likely surpass that of every major disease group, including infection, cancer, and trauma.1

Insulin resistance and diabetes rank among the major cardiovascular risk factors, the presence of
diabetes conferred an equivalent risk to aging 15 years, an impact higher than that of smoking. Patients with diabetes have two- to eightfold higher rates of future cardiovascular events as compared with age- and ethnicity-matched nondiabetic individuals, and 75% of all deaths in diabetic patients result from CHD.²

The peptides B-type natriuretic peptide (BNP) and its precursor, N-terminal pro-BNP (NT-proBNP), are secreted by human atrial and ventricular myocardium,³ it is a counter-regulatory hormone that may play an active role in the response to ischemic injury. The level of BNP may reflect the size or severity of the ischemic insult, even when myocardial necrosis has not occurred.⁴

Several previous studies have shown that, in selected patients with DM treated by diabetologists in teaching hospitals, increased level of NT-proBNP were related to risk of all cause mortality and CV death.⁵

Patients and Methods

Study Design and Population.

Patients with ACS admitted consecutively between April 2016 and April 2017 to an cardiology emergency single center in Baghdad Teaching Hospital were prospectively evaluated with their data registered in the institution’s database. Baseline clinical and admission laboratory characteristics, CAD risk factors, medicines used, in-hospital outcomes, ECG, and treatments were observed. The Ethics Committee of the hospital approved this study. A total of 70 ACS patients were included they divided into two groups according to Blood glucose level (diabetic & non diabetic), and 20 healthy subjects as control.

Data Collection.

From each patient (within 24 h from admition) and control, three ml of venous blood were aspirated from a suitable vein. Samples were collected between (8-9 A.M.) after 10 hours fasting. Blood samples were divided into two parts, one ml transferred to a plain tube to measure the serum level of glucose. The remaining of blood was transferred to another sterile plain tubes for storage to measure the serum levels of (NT-PROBNP, hs-CRP, and hs-Troponin I). The non heparinized blood in the plain tubes were left to clot and then centrifuged by cold centrifuge at 4000 rpm for 5 minutes many times (1-5) to separate the serum and dispensed into tightly closed Eppendorf tubes 1.0 ml and stored at -20 C° until assayed.

Each serum sample was analyzed for urea and creatinin to exclude kidney diseases.

Biochemical parameters included in this study:

The 1- N-terminal pro-brain natriuretic peptide(NT-PROBNP) level was measured by using ELIZA Kits from Biosource, Incorporation.USA. Cat. No : MBS294727.

2-Hs C-Reactive Protein (CRP) level was measured by using ELIZA Kits from Demeditec Diagnostics GmbH, Lise-Meitner-Str.2, 24145 Kiel, Germany, and hs- cardiac troponin I (hs-cTnI) level were measured by using ELIZA Kits from Biosource, Incorporation.USA. Cat.No : MBS165910.

3- Glucose level was measured by using enzymatic colorimetric method.

Echocardiographic parameters were measured in all patients by consultant cardiologists at echocardiographic unit/ Baghdad Teaching Hospital, they involved:

Diameter of left aterium
2- E (left ventricular inflow velocity) / e (tissue doppler velocity) ratio to estimate ventricular filling pressure.
3-Isovolumic relaxation time
4-Decceleration time
5-Left ventricular Ejection Fraction

Statistical Analysis

All data are described as rates and frequencies or means with standard deviations, as appropriate. Differences in the distribution of selected characteristics between patient groups were examined using the chi-square test and Fisher’s exact test for categorical variables. The analysis was performed using the Student’s t-test for normally distributed continuous variables and the Mann-Whitney and Kruskal-Wallis tests for nonparametric variables.

RESULTS

This study included 70 patients with mean±SD of age was (58.77±11.45) years ranged from (25-84) years divided into two groups: Male group included 52(74.3%) patients, and female group included 18 (25.7%) patients.
The control group included 20 healthy persons with mean age \((33.47\pm12.58)\) years and ranged from (20-58) years, divided into two groups male group included 10 (50%) persons and female group included 10 (50%) persons, table (1).

The Patients mean age was significantly higher than control group mean age

\((P\text{-value}=0.0149)\). There was a significant increase in the frequency of ACS among males in comparison to females \((P\text{-value}=0.0027)\).

### Table (1) Frequency distribution of total study sample by age.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Control</th>
<th>Patients</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean± SD</td>
<td>33.47±12.58</td>
<td>58.77±11.45</td>
<td>0.0149 **</td>
</tr>
<tr>
<td>SE</td>
<td>1.49</td>
<td>1.36</td>
<td>--</td>
</tr>
<tr>
<td>Min</td>
<td>20</td>
<td>25</td>
<td>--</td>
</tr>
<tr>
<td>Max</td>
<td>58</td>
<td>84</td>
<td>--</td>
</tr>
<tr>
<td>C.V%</td>
<td>37.6089</td>
<td>19.48</td>
<td>--</td>
</tr>
</tbody>
</table>

### Table (2) Frequency distribution of total study sample by gender.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Control</th>
<th>Patients</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>P-value</td>
<td>---</td>
<td>1.00 NS</td>
<td>---</td>
</tr>
</tbody>
</table>

The patients with ACS were found to have significantly higher mean \((±\text{ SEM})\) value of serum NT-PROBNP concentrations \((p=0.0144)\) as compared with mean \((±\text{ SEM})\) value of serum control group, the mean \((±\text{ SEM})\) value of serum hs-troponin I concentrations did not differ significantly \((p=0.372)\) as compared with mean \((±\text{ SEM})\) value of serum control group, and significantly higher mean \((±\text{ SEM})\) value of serum hs-CRP concentrations \((p=0.002)\) as compared with mean \((±\text{ SEM})\) value of serum control group.

### Table (3) Comparison between patients and control according to biochemical markers.

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Mean ± SEM</th>
<th>TnI: Troponin I (ng/L)</th>
<th>CRP:C-Reactive protein (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>70</td>
<td>203.95 ± 21.42 8.10 ± 0.87</td>
<td>12.73 ± 0.97</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>20</td>
<td>107.79 ± 4.23 7.74 ± 0.48</td>
<td>0.316 ± 0.143</td>
<td></td>
</tr>
<tr>
<td>T-test value</td>
<td>--</td>
<td>34.782 ** 1.973 NS</td>
<td>3.019 ***</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td></td>
<td>0.0144 0.372 0.00252</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** (P≤0.01), *** (P≤0.001), NS: Non-significant \((p <0.05)\).

Results expressed as Mean \((±\text{ SEM})\).

Thirty five (50%) patients out of seventy with ACS were diabetic (On insulin therapy or oral hypoglycemic drug or their fasting plasma glucose more than 126 mg/dl) The mean\((±\text{ SEM})\) values of serum NT-PROBNP concentrations, hs-troponine I, hs-CRP, left atrium diameter and E/e were non significantly higher in diabetic group than non diabetic group, while

mean\((±\text{ SEM})\)values of isovolumic relaxation time and deceleration time were found non significantly higher in non diabetic group than in diabetic group. However, the mean \((±\text{ SEM})\)value of ejection fraction was significantly higher in non diabetic group than in diabetic group, \((P\text{-value}=0.0261)\), (table 4).
Table (4) Effect of diabetes mellitus on biochemical markers and echocardiographic finding (Mean ± SEM).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Non DM (No. = 35)</th>
<th>DM (No. = 35)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT-PRO BNP (ng/L)</td>
<td>199.00 ± 34.28</td>
<td>208.87 ± 29.41</td>
<td>0.651 NS</td>
</tr>
<tr>
<td>hs-TnI: Troponin I (ng/L)</td>
<td>7.45 ± 0.87</td>
<td>8.74 ± 1.02</td>
<td>0.549 NS</td>
</tr>
<tr>
<td>hs-CRP:C-reactive protein</td>
<td>12.52 ± 1.24</td>
<td>12.95 ± 0.84</td>
<td>0.864 NS</td>
</tr>
<tr>
<td>LAD: Left atrium diameter (cm)</td>
<td>3.58 ± 0.67</td>
<td>3.65 ± 0.72</td>
<td>0.527 NS</td>
</tr>
<tr>
<td>E/e</td>
<td>9.02 ± 1.19</td>
<td>9.99 ± 0.84</td>
<td>0.684 NS</td>
</tr>
<tr>
<td>IVRT:Isovolumic relaxation time (ms)</td>
<td>93.06 ± 9.37</td>
<td>83.65 ± 7.25</td>
<td>0.307 NS</td>
</tr>
<tr>
<td>DT:Deceleration time(ms)</td>
<td>207.26 ± 24.71</td>
<td>180.63 ± 19.66</td>
<td>0.427 NS</td>
</tr>
<tr>
<td>EF%: Ejection fraction</td>
<td>53.31 ± 1.49</td>
<td>46.51 ± 1.52</td>
<td>0.0261 *</td>
</tr>
</tbody>
</table>

* (P≤0.05), NS: Non-significant.

DISCUSSION

Age is a strong risk factor for atherosclerotic diseases in western countries. The mortality and morbidity rates begin to increase after the age of 45 years in males and 55 years in females as reported by Walsh JM et al. (1995).6 Although atherosclerosis is typically a progressive disease, it usually does not become clinically manifested until middle age or later. Between ages 40 and 60 (years) the incidence of myocardial infarction increases five fold and death rates from IHD rise with each decade even into advanced ages.7

In the present study, the majority of patients who developed UA and AMI were above the age of 40 years and there was a significant increase in the frequency of IHD with increasing age, the mean age (years) for patients was (58.77±11.45) table(2). This result was the same as that of Ibrahim (2007)8 who found that mean age for patients with IHD in Erbil was 58 years and this indicated that most of the patients were in their middle age. This result also agree with a study of Mackness et al. (2008) who stated that as you get older, your risk for atherosclerosis increases.8 Atherogenesis was considered with distinct chronologic phases.10

It's also found that the frequency of male patients group were (74.3%) patients, and female group were (25.7%) patients, table(1). So there was a significant increase in the frequency of MI and UA among males in comparison to females, these results agree with the study reported by Villar et al. (2008) who found greater incidence of CVD in men and postmenopausal women compared with premenopausal women implies a vasoprotective phenotype of females, which may be influenced by sex hormones. These hormones, particularly estrogen, have modulator effects on the endothelium and circulating cells that have been implicated in vascular inflammation and in the development of CVD.11

The present study result showed the mean(± SEM) value of serum NT-PROBNP concentrations was non significantly higher in diabetic group than non diabetic group as shown in table (4), that was observed in the present study agree with that shown by Abbott R D et al.12 who showed that in multivariable analysis, diabetes was an independent factor for mortality (p=0.0064) when the variable NT-proBNP level was not introduced into the model, but was less significantly associated with mortality (P=0.0107), when NT-proBNP was in the model, their findings are consistent with the previous data showing an increased incidence of cardiogenic shock and in-hospital mortality after Myocardial Infarction in diabetic patients.13
Several pathophysiological mechanisms might explain the increase in plasma NT-proBNP after Myocardial Infarction in diabetic patients. Diabetic patients, even those who are asymptomatic for cardiovascular disease, have frequent and early echocographic abnormalities including increased myocardial stiffness, impaired left ventricular compliance and diastolic dysfunction. ATP deficiency may be responsible for the early myocardial dysfunction observed in diabetes. Indeed, diabetic patients have an intracellular glucose deficiency leading to impaired production of ATP, which does not allow adequate Na+/K+ and Ca2+-ATPase functions. This modification of ion pumps leads to impaired relaxation in the myocardium, which could account for the increased NT-proBNP secretion. Such metabolic features for increased NT-proBNP in diabetes could also explain the independent association between fasting glycaemia and NT-proBNP levels found in the present study.

Moreover, the increased collagen content observed in hearts from diabetic patients is responsible for increased myocardial stiffness and may participate to the elevation of plasma NT-proBNP in diabetes. Also the study the genetic study of the natriuretic peptides BNP and NT-proBNP in patients with cardiovascular disease. In addition, the elevated plasma NT-proBNP levels, observed in diabetic patients after Myocardial Infarction, may also be explained by the more severe ischemia, compared to non-diabetic patients, even with a similar infarct size. Indeed, autopsic data have shown a lower capillary density in the myocardium of diabetic patients who died from Myocardial Infarction, which could partly explain the severity of ischemia. Furthermore, endothelium dysfunction, which has been reported in diabetic patients, could also be involved in the extent of ischemia. Also can be study the other parameters to more evaluate and detect early diagnosis.

**CONCLUSIONS**

Measurement of NT-PROBNP on admission can predict early and degree of left ventricular remodeling in diabetic patients with Acute coronary syndrome.

**Ethical Clearance:** All subjects in this study were taken written consent before participation in this study according to ethical approval of ministry of health and environment in Iraq.

**Conflict of Interest:** None

**Source of Funding:** Self

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Evaluation of Antibacterial Activity and Qualitative Phytochemical Analysis of *Enteromorpha Ralfsii*

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**ABSTRACT**

Filamentous specie of algae (*Enteromorpha ralfsii*) was isolated from Baher AL-Najaf region Iraq were tested against some bacterial species. methanolic (Hot and Cold) Extracts of *Enteromorpha ralfsii* were screened to show the antibacterial activity. Four different concentrations (w/vol.) 12.5, 25, 50 and 100 mg/ml were made in each of the above Extracts were loaded on agar plates, containing test bacteria, *staphylococcus aureus, staphylococcus epidermidis, Bacillus substilis, Escherichia coli, Klebsella sp.*, and *pseudomonas aeruginosa*. The hot methanolic extract was efficiency for making extract that showed good zone of inhibition in bacterial species maximum up to 23 mm than the lower value was 9 mm. Chemical analyses showed that the active chemical compounds for hot methanolic extract alga (*Enteromorpha ralfsii*) extract was contains Tannins, Terpenoid, Flavonoids and Saponins. While Alkaloids, Glycosides and Phenols, were absent. The methanolic extract was further chemically characterized by using GC–MS in order to be tentative identify the compounds responsible for such activities. The main compositions were found in hot methanolic crud extract, these were: Nonadecane (16.2%) is an alkane hydrocarbon, Alkanes while Pentadecane represented (39.6%) this compounds which had antimicrobial activity. These results indicate that the methanolic extract of *Enteromorpha ralfsii* exhibited appreciable antimicrobial activity and could be a source of valuable bioactive materials for health products.

**Keywords**: *Cladophora glomerata, antibacterial and active compounds.*

**INTRODUCTION**

Macroalgae are considered as a source of bioactive compounds as they are able to produce a great variety of secondary metabolites characterized by a broad spectrum of biological activities. Compounds with antioxidant, antiviral, antifungal and antimicrobial activities have been detected in brown, red and green algae [1, 2]. The use of algal species extracts for medicine has been well known and their analysis begun from 1950 in medical industry. The antimicrobial action was an indication that the algae have potential to synthesize vital bioactive secondary metabolites [3]. Macroalgae have been known to produce antimicrobial action against gram positive and gram negative bacteria [4]. Algae have been reported to synthesize compounds like antibiotics which are effective against fish and human pathogen bacteria [5].

The problem of getting treatment against resistant pathogenic bacteria is becoming increasingly difficult [6]. Since pathogens gaining resistance to antibiotic, is common due to indiscriminate use of antibiotics, much attention is needed to kill or control the pathogens using bioactive substances. In this study, our aim was to study the chemical composition of extracts from fresh water green algae *Enteromorpha ralfsii*, and to determine their antibacterial activity in order to find a potential natural source of bioactive compounds, food supplements and biomedical uses.

**MATERIALS AND METHOD**

Collection and Preparation of Sample

Samplings were carried out from Bahr Al-Najaf is situated southwest of Al-Najaf Al-Ashrafi city–Iraq, which located between 31° 45’ and 31° 57’ north latitude and 44° 7’ and 44° 16’ east longitude during autumn 2014. Samples of *Enteromorpha ralfsii* were collected manually from the rock. The harvested macro algae were stored in plastic bags and transported to the laboratory. Voucher specimen of species were pressed and stored in
5% formalin for identification according to Davis and Burrows [7, 8]. Biomass was rinsed with fresh water to eliminate other materials such as sand, shells, etc. The macro-algae were stored in the laboratories and dried at 50°C under ventilation in an oven and then grounded to powder form by the blender. All experiments were implemented according to LABs lows of higher education and scientific research in Iraq.

**Preparation of algae extracts**

Algae samples were washed with distilled water to remove the adhering particles. They were dried in the shaded place. The dried algae were powdered, weighed and stored in clean containers all algae extraction were done according to [9]. There are two types of water extraction method used

** Soxhlet extraction**

5g of dried algae powder was extracted for 4-5 hrs with (150ml) organic solvent (methanol.) by hot continuous per location method in Soxhlet apparatus. After the effective extraction solvent was concentrated using rotary evaporator.

**Preparation of different algae extracts concentrations**

Stock solution was prepared for each extract, 0.5 g were dissolved with 2.5 ml of the appropriate DMSO, and then the volume was made up to 5 ml that equal 100 mg/ml.

**Antibacterial Assay**

Antibacterial tests of algal extracts were performed in vitro using the well diffusion method [10], in Petri dishes. The results are expressed by measuring the diameters in millimeter of the inhibition halos of bacterial growth around the well. Methanol (100%) without macro-algae extracts were used as negative control. All tests were performed in triplicate, and clear halos greater than 10 mm were considered as positive results, experimental in comparison data represent mean ± SD of each sample.

**Indicators of Active Compound in Extracts**

The presence of active compounds in the studied algae were determined by adopting standard protocols [11, 12].

Gas Chromatography-Mass Spectrometry

For GC-MS analysis, a high-temperature column (Inert cap 1MS; 30 m × 0.25 mm id × 0.25μm film thickness) was purchased from Agilent Technologies (SHIMADZU—Japan), by employing a high-temperature column. Derivatization of each sample was eliminated. The injector and detector temperatures were set at 280°C while the initial column temperature was set at 100°C. A 5 μl sample volume was injected into the column and ran using split (1:10) mode. After 1 min, the oven temperature was raised to 225°C at a ramp rate of 12.5°C/min (hold time 4 min). The oven temperature was then raised to 300°C at a ramp rate of 7.5°C/min (hold time 5 min). The helium carrier gas was programmed to maintain a constant flow rate of 17.5 mL/min and the mass spectra were acquired and processed using both Agilent GC-Mass. Solution (SHIMADZU—Japan) and postrun software. The compounds were identified by comparison of their mass with NIST library search and authentic standards [10].

**RESULTS AND DISCUSSION**

**Morphological Structure of Enteromorpha ralfsii**

*Enteromorpha ralfsii* macroalgae attached to rock and plant, fine, detached hair-like form cell detail of a cylindrical side branch, showing several lines of cells, branching pattern showing irregular side branches containing several lines of cells (multi seriate), *Enteromorpha ralfsii* macroalgae attached to rock and plant, fine, detached hair-like form cell detail of a cylindrical side branch, showing several lines of cells, branching pattern showing irregular side branches containing several lines of cells (multi seriate), figure 1. Branches are tufted, arising singly, the branches becoming irregular in old algae. Usually it tends to stay on one spot, which makes it easy to remove, these findings agreed with [13,14].

![Figure 1: Filaments of Enteromorpha ralfsii showing the branch and multi seriate (40X).](image-url)
Antibacterial activity of algae extracts

Antibacterial activities of crude extracts of algae \((\text{Enteromorpha rafslis})\) were carried out from Bahr Al-Najaf –Iraq determined by well diffusion assay. The hot methanol form of the extract of algae exhibited varying degree of antibacterial activities against the test organisms in different concentrations and the results are summarized in Table 1 and figure 2.

Table 1. antibacterial activity of \(\text{Enteromorpha rafslis}\) hot methanol extract. (inhibition zone was measured to the nearest millimeter).

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Concentrations mg/ml</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>(\text{S. aureus})</td>
<td>21±1</td>
<td>16±2</td>
</tr>
<tr>
<td>(\text{S. epidermidis})</td>
<td>20±2</td>
<td>18±1</td>
</tr>
<tr>
<td>(\text{Bacillus subtilis})</td>
<td>16±0.5</td>
<td>14±2</td>
</tr>
<tr>
<td>(\text{E. coli})</td>
<td>15±1</td>
<td>13±0.5</td>
</tr>
<tr>
<td>(\text{Klebsiella sp.})</td>
<td>13.5±1</td>
<td>11±1</td>
</tr>
<tr>
<td>(\text{P. euroginosa})</td>
<td>13±1</td>
<td>11±1</td>
</tr>
<tr>
<td>LSD value</td>
<td>2.975 *</td>
<td>2.355 *</td>
</tr>
</tbody>
</table>

* (\(P<0.05\)), NS: Non-Significant.

- : No inhibition action

The antibiotics are synthetic chemicals and may have side effects are now time to replace with natural antibiotic source \([15]\). It is necessary to make natural extracts that are equally effective as the artificially prepared antibiotics. There are chances that bacteria become resistant against the used antibiotic which is serious threat in biological treatments. According to table 1, \(\text{S. aureus}\) showed maximum zone of inhibition. it was clear that extract in acetone at concentration 100mg/ml of algae with 21 mm of zone of inhibition were closer than others. According to table 1, \(\text{Klebsiella sp.}\) showed minimum zone of inhibition. it was clear that extract in acetone at concentration 12.5mg/ml of algae with 7.5 mm of zone of inhibition.

Figure 2: antibacterial activity of Crude extract \(\text{Enteromorpha rafslis}\) against \(\text{S. epidermidis}\) at different concentrations.

Algae had proven a good source for bacterial resistance. \([16]\) Proved that methanolic extracts of \(\text{Spirulina platensis}, \text{Chlorella pyrenoidosa}\) and \(\text{Nostoc muscorum}\) were good against the human pathogenic bacteria and fungi.
Phytochemical evaluation

The results showed the presence of active compounds in acetone extract of Enteromorpha rafslsii. The results showed that extract of Enteromorpha rafslsii had Tannins, Terpenoid, Flavonoids and Saponins. While Alkaloids, Glycosides and Phenols, were absent as shown in table 2. This results agreed with many studies such as [10] they screened the most active compounds in macro-algae. Biochemical analysis were being undertaken to determine the structure and nature of compounds responsible of the bio-activity of the extract with high antibacterial potency.

Table 2: Presence or absence of active compounds in Enteromorpha rafslsii extract.

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Compound</th>
<th>Hot Acetone Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Glycosides</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tannins</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Terpenoid</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Flavonoids</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Phenols</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Saponins</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

At present in table 3 and figure 3, analysis by Gas chromatography–mass spectrometry (GC-MS) is essential for the identification of natural organic compounds. Enteromorpha rafslsii extract chemically characterized in order to determine the compounds responsible for the biological activity observed using GC–MS techniques. Different natural antimicrobial compounds have been described in algae belonging to a wide range of chemical classes, including indoles, terpenes, acetogenins, phenols, fatty acids and volatile halogenated hydrocarbons [17]. Thus, GC–MS methods were used to analyze compounds, in methanol extract that showed antibacterial activity from the studied alga.

From the table (3) 8-major compounds were found in hot alcoholic crud extract of Enteromorpha rafslsii ,these were: Nonadecane (16.2%) is an alkane hydrocarbon, Alkanes while Pentadecane represented (39.6%) from the crud hot extract of Enteromorpha rafslsii the alkane hydrocarbon the generic name for the group of aliphatic hydrocarbons Cn-H2n+2 ,which represented reactive groups.

The result presumes that the long chain hydrocarbons may act as potential bioactive substance and can be exploited in pharmaceutical preparations. The cultivable nature of seaweeds is an added advantage for mass production of potential antibacterial products. Further study is in progress to find out the mechanism of inhibition of pathogens by the purified compounds and to study the antioxidant in addition to anti-inflammatory properties of Enteromorpha rafslsii. Our results are in accordance with the reported investigations [18, 19]

Table 3: The major identified compounds of hot crude methanolic extract of Enteromorpha rafslsii by using GC-Mass spectrophotometer.

<table>
<thead>
<tr>
<th>Rt</th>
<th>Compound</th>
<th>Area%</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.98</td>
<td>Hexadecane–tetra methyl</td>
<td>10.2</td>
</tr>
<tr>
<td>13.78</td>
<td>Nonadecane</td>
<td>16.2</td>
</tr>
<tr>
<td>14.11</td>
<td>Pentadecane</td>
<td>39.6</td>
</tr>
<tr>
<td>16.61</td>
<td>Hexadecane- tetra methyl</td>
<td>3.6</td>
</tr>
<tr>
<td>16.75</td>
<td>Octadecane</td>
<td>5.3</td>
</tr>
<tr>
<td>18.94</td>
<td>Tetradecane dihydroxyl</td>
<td>2.1</td>
</tr>
<tr>
<td>21.72</td>
<td>Hexadecane 2-hydroxyl</td>
<td>4.8</td>
</tr>
<tr>
<td>23.63</td>
<td>Hexadecane 2-hydroxyl</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Figure (3): The chromatogram of GC-Mass spectrophotometry showed that hot extract of Enteromorpha rafslsii was a mixture of at least 8 compounds.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding
References


Skin Rejuvenation Using Platelet-Rich Plasma in Al Muthanna Governorate/Iraq

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College of medicine / Al Muthanna university / Iraq, ²College of Medicine/ Al Muthanna University,
Al-Hussein Teaching Hospital, Al Muthanna Governorate/Iraq

ABSTRACT

The ageing of skin is a continuous organic process, It mostly produced by internal and external causes. Face rejuvenation takes a wide attention from the dermatologist. Growth substances released Platelet rich plasma is a useful method in face and neck skin rejuvenation, with no serious side effects. could work on the stem cells of the skin, producing smoother and less noticeable wrinkles. The aim is to evaluate the effectiveness of Platelet rich plasma is a useful method in face and neck skin rejuvenation, with no serious side effects in skin rejuvenation. This is a therapeutic study done at Laser private clinic in Samawah/Iraq. Sixty female patients with aged skin were involved in our study, The age of 35-60 years. The course of treatment consisted of 3 sessions of injectable PRP for the entire face and periorbital region with 1 month interval among each session with follow up period for additional 1 and 3 months after the last session to assess improvement of skin texture. The improvement scale was so obvious at 6th months (33%) small to (38%) modest progress. Evaluation of satisfaction after six months: 16 patients (27%) showed slight reactions, and 26 patients (43%) had trace changes and they were fulfilled with the look. The procedure has moderate pain as side effects. From this can be concluded that Platelet rich plasma is a useful method in face and neck skin rejuvenation, with no serious side effects.

Keywords: Platelet-rich plasma, PRP, skin rejuvenation.

INTRODUCTION

Platelet-rich plasma (PRP) is a concentrate of platelets that contain plasma in a little volume which is 4-7 times the concentration of platelet more than the usual blood. The PRP was used for many years as a beneficial management for different medical as well as surgical purposes. Most of the studies are carried out in field of athletic medicine, orthopedics and dental. In recent times articles regarding dermatological topics start to be available, PRP has been used dermatology include wound healing, alopecia, skin rejuvenation, striae distensae and periorbital hyperpigmentation[1]

The aging of skin is a complex and continuous organic process, characterized by furrows, loss of volume, telangiectasia, pigmentation, coarse texture and skin slackness. It mostly produced by age progression either by internal causes like inheritance or external causes such as photoaging caused by ultraviolet radiation. General look is related to self-confidence, character, and inspirations agreement by surrounding. For that reason, recently face rejuvenation had been increasing focusing and take a wide attention from dermatologist. PRP shows a dynamic role in the healing of wound by producing a large number of growth factors (GFs) such as transforming growth factor, vascular endothelial growth factor, platelet-derived growth factor, fibroblast growth factor, epidermal growth factor [2-3]. These substance have essential role in repairing tissue and healing. So, the concentrate of growth factors could be beneficial in wounded tissues to providing nimbleness to the renewal procedures [4]; the release of growth factors lead to enhance early healing. As it was improved that various forms of stem cells found in the skin (cells existing in the hair follicle) in addition to cells of mesenchymal source. In concept, growth substances released PRP could work on these stem cells, helping proliferation and differentiation producing smoother and less noticeable wrinkles [5,6]. The purpose of our study was to evaluate the effectiveness of PRP on the rejuvenation of skin of face.
Materials and Technique:

This is a satisfying trial learning done at Laser private clinic in Samawah / Iraq throughout May 2016 till December 2017. Sixty female patients with aged skin were involved in our study, The age between 35-60 years (mean ±43). The skin type include III and IV according to Fitzpatrick standard. The course of treatment consisted of 3 sessions of injectable autologous PRP for the entire face and periorbital region with 1 month interval among each session with follow up period for additional 1 and 3 months after the last session to assess improvement of skin texture. Before starting treatment, isopropyl alcohol (70%) use to clean the face. Topical anesthesia used in form of cream (EMLA) which is a mix of 2.5% lidocaine plus 2.5% procaine put for 30 minutes and then splashed to get entirely dried skin. Topical cream of antibiotic was recommended after each meeting and the patients were informed to put on a sunscreen during entire course of treatment. Before starting the sessions we took 3 pictures for the patient one from the front and two for each side of the face (Nikon D 5200 Digital Camera, 24.1 megapixels HD). A subsequent set of pictures was taken in each meeting via the same camera, camera sets, patient positioning and room light. The whole procedure was completely explained to the patients including the procedure of platelet-rich plasma and how it action, the period needed for the session, the appearance next to procedure, and scenarios of effective treatment. The patients also learned about possible risk and side effects of the technique and how to take care of skin before and after the procedure.

We took 13.5 cc of blood from patient by 20 ml syringe containing 1.5 ml of natrium citrate 3.13% as anticoagulant and then the blood collected in a special sterile commercially PRP kit (Ycellbio-kit Korea). The tubes were then centrifuged at 3500 (rpm) for 5 minutes. This centrifugation splits blood constituents depend on different sedimentation rate, ex. RBCs (weightiest), while platelets (lightest). By centrifugation the plasma were also separated into 2 parts; the higher one composed of 3 ml of platelet poor plasma (PPP) while the inferior one composed of 3 ml of platelet rich plasma PRP (buffy coat). The 3 mL of PRP was first quietly aspirated to prevent mixing it with PPP or RBC and then adding calcium chloride to it for activation (0.1 mL per 0.9 mL of PRP) to get a 3 ml of activated PRP. The remaining 3 mL of PRP was then aspirated from the tube.

Exclusion criteria include: Pregnant and lactating women, prolonged health disease (e.g: chronic infections, diabetes and blood disorders), platelet dysfunction syndrome, critical thrombocytopenia (<50,000/ml), skin disorders: local inflammation or herpes simplex infection at the place of the technique, using NASID or anticoagulant drugs within 48 hr before procedure, recent fever or illness, anemia Hb less than 10 g/dl, steroid injection within 1 month at site of procedure, history of keloid formation, isotretinoin use within 6 months, photosensitive disorders, immune suppression, usage of other skin rejuvenation methods such as botox, chemical peeling, filler injection, mesotherapy and laser skin resurfacing during the preceding year; and use of cosmetical agents having vit C, retinoids that may interfere with synthesis of collagen.

Complete evaluation of clinical effectiveness was performed by satisfaction score of patient and standardized digital photography showed to dermatologists (double blinded), by the following scale:

0 =no variation, 1 =mild progress (0 to 25%), 2 =moderate progress (26 to50%), 3 = good progress (51 to75%), 4 = excellent progress (>75%)

patients were examined to assess the level satisfaction level of facial wrinkle, pigmentation, skin texture, tightness and elasticity by providing themselves a mark from 0-4 points and then the scores were interpreted by means of the following rule:

0 =no variation, 1 = trace, 2 = slight, 3 = moderate, 4 = brilliant

The scale of pain also calculated; 0–3 was used to define the level of distress throughout the procedures as:

0 = no pain, 1 = slight pain, 2 = modest pain, 3 = severe pain.

All subjects in this study were taken written consent before participation in this study according to ethical approval of ministry of environment and health in Iraq..

Statistical information were investigated by Chi square test using SPSS version 22, P value <0.05 is reflected significant informative data.

RESULTS

Sixty females were involved in this research. All patients finished a research, consisting of the 3 monthly
injectable sessions of PRP and the 3 months period of follow up.

Regarding to figure and table (1): the dermatologist assessment after one month from the first PRP injection show only 3% patients had moderate progress and 10% had slight progress while 87% had no variation, after a subsequent session the results became interested, encouraging and showed knowing the progress. The patients showed the more favorable response. At the end of the 3rd session (3rd month), the results showed 3% had brilliant progress and 7% of them knowing progress and the majority of patients 53% had modest progress comparing with 1st and 2nd month.

The improvement scale was so obvious during the period of follow up(a 6th month from the first session) (33% small to 38% modest progress), (5%) brilliant progress and (17%) knowing the progress. P-value were < 0.05 and the results are significant.

Table (1): Clinical evaluation of dermatologists:

<table>
<thead>
<tr>
<th>no variation</th>
<th>Score</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Small progress</td>
<td>modest progress</td>
<td>knowing progress</td>
<td>brilliant progress</td>
<td>total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>52</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>% of Total</td>
<td>87%</td>
<td>10%</td>
<td>3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>2nd month</td>
<td>Count</td>
<td>40</td>
<td>15</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>% of Total</td>
<td>67%</td>
<td>25%</td>
<td>5%</td>
<td>3%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>3rd month</td>
<td>Count</td>
<td>9</td>
<td>13</td>
<td>32</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>% of Total</td>
<td>15%</td>
<td>22%</td>
<td>53%</td>
<td>7%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>Count</td>
<td>4</td>
<td>20</td>
<td>23</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>7%</td>
<td>33%</td>
<td>38%</td>
<td>17%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>Df</td>
<td>p-value</td>
<td>133.939a</td>
<td>12</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation of satisfaction level was notable and had a gradual improvement, this showed in table and figure (2); the results after six month from the first session were as following: 5 patients (8 %) testified brilliant reaction, 4 patients (7 %) were moderate reactions, 16 patients (27 %) showed slight reactions, and 26 patients (43 %) had trace changes and they were fulfilled with the look. P-value was < 0.05 so the results were reflected a significant. Table (1) shows that the 2 elements (counts and months) are dependent (there is a relationship between two factors) Similar conclusion can be reported for outcomes.

Figure (2): Self-assessment of the level of satisfaction.

Table (2): assessment of the level of satisfaction

<table>
<thead>
<tr>
<th>month</th>
<th>no variation</th>
<th>score</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>slight</td>
<td>moderate</td>
</tr>
<tr>
<td>1st</td>
<td>Count</td>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>%of Total</td>
<td>83 %</td>
<td>13 %</td>
</tr>
<tr>
<td>2nd</td>
<td>Count</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>%of Total</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td>3rd</td>
<td>Count</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>%of Total</td>
<td>29 %</td>
<td>40%</td>
</tr>
<tr>
<td>6th</td>
<td>Count</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>%of Total</td>
<td>15 %</td>
<td>43 %</td>
</tr>
</tbody>
</table>

Value  DF  P-value
Pearson Chi-Square  71.519a  12  .000
The PRP doses were well accepted. Some patients faced variable degrees of pain as side effects, but they didn't want for an additional anesthesia (Table 3). No, any serious side effects or complications faced by patients apart from erythema and little bruises at the injection places which freely recover few hours- days later.

**Table (3): pain sensation**

<table>
<thead>
<tr>
<th>Pain severity</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Mild pain</td>
<td>22</td>
<td>37%</td>
</tr>
<tr>
<td>Moderate</td>
<td>31</td>
<td>52%</td>
</tr>
<tr>
<td>Sever</td>
<td>5</td>
<td>8%</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Preserve or restore a young-looking appearance has become a demand for various people especially in females. This increases the need for effective methods for rejuvenating the skin. These methods should be well tolerated, effective, free from the side effect, quick with limited time consuming and rational cost. Various combinations of dermatological management need to be experienced to increase the treatment outcome and decrease side effect for each one, and to overcome the physiological signs of face skin aging; which are roughness, spotted dyschromia, textural changes and shallow wrinkling[7]. The most common cause of those changes was the decrease of skin functions to repair tissue and cell replacement with age. As PRP therapy widely used in many medical and surgical fields. In dermatology; it is experimentally used for wound healing, alopecia, tissue regeneration, skin rejuvenation effects, and scar revision; since 2005, PRP has been used as a new antiaging technique, so we try here to approved the effectiveness of PRP in skin remodeling and rejuvenation (8,9).

In our study the dermatological assessments after the first session only and 10% had slight and 3% of patients with moderate improvement while the majority 87% showed no changes when compare this results with Al- Shami study showed 30% and 8% as mild and moderate improvement respectively in regard to dermatologist assessment. 62% with no changes. This modest expected because PRP action depends on skin remodelling by the use of body own natural growth factors activation. This certain process needs time to be clear clinically (10).

During the period of follow up after 3 and 6 months from the first session, there were interested result mention by the dermatologists ( p-value was < 0.05). The same excellent result mention in Al Shami study.(10)

Regard patients satisfaction there were increasing from the first month after injection till 6 months follow up period and the result statistically significant (P value=0.0001. Patient satisfaction was more clear than doctor assessment this could be explained that the patient disappointed from different kinds of medical treatment and cosmetic that had been used for a long time, in addition to various aesthetic device and procedure like filler or Botox which is costly and need a recurrent injection. The total result in relation to dermatologists and patients assessment indicate the effectiveness of PRP in skin rejuvenation and overall improvement of patient’s own looking and self-esteem. PRP is effective especially in small wrinkles and improves skin texture and elasticity.

In PRP increased the volume of collagen and the length of the dermoepidermal junction depend on the fact that platelets contain growth substance and cytokines that can modify any inflammation, infection and bleeding [11]. Many Research displays that platelets liberate bioactive proteins responsible for osteoblasts, macrophages attraction, that promote degenerated and necrotic tissue removal , and enhance healing and regeneration of tissue [12].

Regarding application of PRP in aesthetic medicine; it described enhancing dermal elasticity through encouraging the elimination of extracellular matrix (ECM) constituents and provoking new collagen production by dermal fibroblasts by many molecular processes[13].

Intradermal injections of PRP at 3 monthly interval in have revealed satisfactory outcomes in neck and face rejuvenation and scar remodeling [14]. Kang et al reveal the PRP doses given monthly to 3 months, produced very good effects for infra orbital rejuvenation with no side effects [15].

Kang BK revealed that a combination of both; the topical PRP application and non-ablative fractional laser therapy, resulted in enhancement of elasticity of
the skin, increase in collagen density and decrease in erythema index. Histological analysis displayed the rise in collagen extent an increase in the dermal-epidermal junction, and fibroblasts in the treated skin [16].

The pain sensation at the site of injection is common and our study was showed that majority of patients explain the mild-moderate sensation of pain, this was possible because of calcium chloride activator or related to individualized pain threshold or may the topical anesthesia need more time to exert its action than the half hour [17].

Other complications include mild erythema, ecchymosis or petechial which resolve spontaneously without treatment. PRP is devoid of any serious side effects, proper precautions can be avoided pain or secondary infection as the reaction occurs at the site of injection, PRP has no rule in a spread of viral infections hepatitis B, C or HIV [18].

The injectable PRP role in the of rejuvenation of skin is not entirely measured. The researches that explore their effect are incredibly narrow. Relative revisions are poor to compare PRP with other modality of treatment. This might be the point that PRP is somewhat a new skill use in aesthetics and skin problems [19]. Additional revisions & studies are suggested to validate these effects and develop such plan as a fruitful technique for improving the distress of the patients.

The patient opinion of the cure appears to be essential due to it has an exact effect on patients’ body appearance and self-esteem [20], numerous patients revealed that they practiced noticeable progress in ‘skin quality’ as well as more well-adjusted and uniform skin pigment and accepted makeup can wear. In overall, PRP is beneficial and so benign in skin rejuvenation and may make available solution for distressing skin problems.

CONCLUSIONS

PRP is a useful method in face and neck skin rejuvenation, It is well accepted with no serious side effects. Additional comparative researches with other rejuvenation modalities are suggested.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

REFERENCES


Assessment of Mothers’ knowledge upon their Children with Enzyme Deficiency (G6PD) in Pediatric Teaching Hospital at AL-Hilla City

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Pediatric and Mental Health Nursing, College of Nursing, Babylon University

ABSTRACT

The Aims of the study was To identify knowledge of mother’s toward their children with G6pd. and find out demographic characteristic of mother’s children with G6pd like age level of education. the study design as descriptive study of mother and child, included 200 children (100 males and 100 females) aged 1 month to 15 years. it was carried out of maternal and child Babylon hospital and its period extended from 20 november 2016 to 12 January 2017. The results of Present study found that the overall prevalence of G6PD deficiency was 15.3% (38.5% in males, 61.5% in females). Mean oxygen saturation, heart rate and hematocrit were not significantly different in G6PD deficient and G6PD sufficient children. In conclusion; The odds of G6PD deficiency were decreased in Igbo children compared to Yoruba children. There was no association between vital parameters or hematocrit and G6PD deficiency. We found that a history of scleral icterus may increase the odds of G6PD deficiency, but we did not exclude other common causes of icterus such as sickle cell disease or malarial infection.

Present study need molecular screening for all deficient patients admitted to pediatric hospitals due to hemolytic crises. We recommended establishing and conducting educational awareness programs for G6PD deficiency especially among mother’s. and specific clinical follow up program for the deficient children and their families. And establishing nationwide program of newborn screening for G6PD deficiency.

Keywords: Mother, Knowledge, Effect, Glucose 6 phosphate deficiencies, School age.

INTRODUCTION

Glucose-6-phosphate dehydrogenase (G6PD) deficiency affects some 400 million people worldwide and is the most common human enzymopathy [1]. G6PD is found in the cytoplasm of all cells and is responsible for the production of the reduced form of nicotinamide adenine dinucleotide phosphate (NADPH), a coenzyme which maintains the intracellular pool of reduced glutathione and thereby protects cells against oxidative damage. Deficiency of G6PD particularly impacts red blood cells, as they lack nuclei and mitochondria and must therefore rely solely on G6PD for production of NADPH and reduced glutathione and protection from oxidative challenge.

In regions of the world such as Iraq the prevalence of G6PD deficiency ranges from 15–26% [2]. The public health burden of this condition is significant. G6PD deficiency contributes to neonatal jaundice which is accompanied by hyperbilirubinemia and puts infants at risk for kernicterus within the first few days of life. Kernicterus can lead to hearing deficits, behavior problems, and permanent neurologic damage. During childhood, many children with G6PD deficiency are healthy until they are exposed to a pro-oxidant medication or chemical. Classically, anti-malarial drugs are strong pro-oxidants and have substantial use in Babylon Iraq. Additionally, exposure to the pro-oxidant naphthalene, the active ingredient in mothballs, is common among young children. In G6PD deficient children, pro-oxidant exposure can lead to a rapid imbalance in the redox status in red blood cells leading to hemolysis and resultant severe anemia, heart failure, and even death if not recognized early.

The WHO recommends population screening in regions were the prevalence of G6PD deficiency is 3–5%
or more [2], but this has yet to become routine practice in many parts of Iraq. Barriers to screening include cost, underestimation of the public health impact of G6PD deficiency by the medical community, lack of awareness of G6PD deficiency among lay people and a paucity of guidelines regarding which high risk groups should be preferentially screened when general population screening is not possible. There are several screening methods available, one of which is the fluorescent spot test3.

In this study, we employed the fluorescent spot test to determine the prevalence of G6PD deficiency in the West Iraq town of Ogbomoso and some of its neighboring villages. The estimated population of Ogbomoso is just over one million. There are two major hospitals in the town, neither of which routinely screen children for G6PD deficiency.

In the course of this study, we also investigated whether simple measures such as analysis of heart rate and oxygen saturation or screening questions about symptoms of hemolysis could identify healthy children with G6PD deficiency.

### METHODOLOGY

**Design of the study:** descriptive study of mother and child.

**Setting of the study:** the study was carried out of maternal and child Teaching hospital in Babylon city.

**Time of the study:** the study period extended from 20 November 2016 to 12 January 2017.

Data were collected according to ethical approval of ministry of environment and health in Iraq.

Study implemented by self-fund.

### RESULTS

**Table (1): Distribution of the study samples according to the age and gender**

<table>
<thead>
<tr>
<th>Item</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8 years</td>
<td>43</td>
<td>21.5</td>
</tr>
<tr>
<td>9-11 years</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>12-14 years</td>
<td>78</td>
<td>39</td>
</tr>
<tr>
<td>&gt;14</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>77</td>
<td>38.5</td>
</tr>
<tr>
<td>Female</td>
<td>123</td>
<td>61.5</td>
</tr>
<tr>
<td><strong>School Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>42</td>
<td>21</td>
</tr>
<tr>
<td>8 years</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>Eleven</td>
<td>44</td>
<td>22</td>
</tr>
<tr>
<td>The eleven or more</td>
<td>18</td>
<td>9</td>
</tr>
</tbody>
</table>

**Table (1)** show that the majority of children 39% were (12-14). The average age was (14) years. In males, the prevalence was 38.5 and in females it was 61.5. A total of 200 children (100 males and 100 females) were screened for G6PD deficiency. The majority of children were of Iraq (77.5%). Participants ranged in age from 1 month to 15 years. Children of age 6 years or younger made up 35.6% of participants. A total of 100 children belonged to 50 distinct families. These families contained 2 to 6 children.
Table (2): Socio-economic status for mothers in the Families

<table>
<thead>
<tr>
<th>Variables</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>26-35</td>
<td>25</td>
<td>12.5</td>
</tr>
<tr>
<td>36-45</td>
<td>33</td>
<td>16.5</td>
</tr>
<tr>
<td>46 and more</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td><strong>Educational level of mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td>Primary</td>
<td>58</td>
<td>29</td>
</tr>
<tr>
<td>Intermediates</td>
<td>51</td>
<td>25.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td>Institutes or above</td>
<td>33</td>
<td>16.5</td>
</tr>
<tr>
<td><strong>Occupation of mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>164</td>
<td>82</td>
</tr>
<tr>
<td>Worker</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td><strong>Socioeconomic status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low level</td>
<td>110</td>
<td>55</td>
</tr>
<tr>
<td>Moderate level</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>High level</td>
<td>36</td>
<td>18</td>
</tr>
</tbody>
</table>

Table (2) show that the socioeconomic background of the studied children’s families. According to the age, (27%) of the mother age were (16-25) years old. Forty eight (24%) of the mother were illiterate educational level. In relation to mother’s occupation, most of them were housewife (82%) and (18%) of them were workers.

Majority of the patients (55%) belonged to poor class followed by satisfactory (27%) and good (18%).

**DISCUSSION**

the majority of children was 39% for (12-14).the average of age was (14) years. In males, the prevalence was 38.5. and in females it was 61.5. The majority of children were of Iraq (77.5%). Participants ranged in age from 1 month to 15 years. Children of age 6 years or younger made up 35.6% of participants. A total of 100 children belonged to 50 distinct families. These families contained 2 to 6 children.

The socioeconomic background of the studied children’s families. According to the age, (27%) of the mother age were (16-25) years old. Forty eight (24%) of the mother were illiterate educational level. In relation to mother’s occupation, most of them were housewife (82%) and (18%) of them were workers.

Majority of the patients (55%) belonged to poor class followed by satisfactory (27%) and good (18%).

The overall prevalence of G6PD deficiency in this study was within the range of what is reported for Babylon city as a whole and is similar to the rate reported in a recent study conducted in the same region of Babylon city[2, 4]. G6PD deficiency is an X-linked condition and as expected, we found that the odds of deficiency were 3.6 times higher in males compared to females.

In this study, we found that ethnic group may be associated with G6PD deficiency, although the effect was not statistically significant after accounting for multiple testing, possibly due to the relatively small number of non-Babylon children in this study. To our knowledge, this study is the first to report such differences in prevalence among a seemingly homogenous population.

To try to understand these differences, we must review what is currently known about the epidemiology of G6PD deficiency.

The notion that malaria protection has played a role in the global distribution of G6PD deficiency is now widely accepted. Several studies have shown that G6PD deficiency protects against severe malarial anemia although the data is unclear about whether this protection is afforded to only heterozygotes or to...
homozygotes and hemizygotes as well\cite{1}. \textit{Plasmodium falciparum} is endemic in Babylon. A selective advantage against malaria explains the high prevalence of G6PD deficiency in Babylon as a whole, but does not account for the differences in prevalence between the ethnic groups.

Malaria protection is also the reason sickle cell disease disproportionately affects people of Iraq. The genes responsible for sickle cell disease and G6PD deficiency are on different chromosomes and research has shown that the incidence of G6PD deficiency in sickle cell disease is not greater than would be expected by chance \cite{5}. The bulk of evidence also suggests that G6PD deficiency does not increase the incidence of acute anemic episodes or the severity of hemolysis in people with sickle cell disease \cite{6}.

The G6PD A- variant is thought to account for 90% of G6PD deficiency, with about 90% of G6PD A- resulting from the G6PD \cite{1}. A recent study conducted in The Babylon, West Iraq, found that another genotype, G6PD, was actually the most common cause of G6PD A- in that part of the continent \cite{7} suggesting regional genotypic differences in G6PD deficiency in Iraq.

**CONCLUSIONS**

The high prevalence of G6PD deficiency in Babylon presents a significant public health burden. Screening for G6PD deficiency has yet to become routine practice in many parts of Babylon, partly due to cost and a paucity of guidelines regarding which high risk groups should be preferentially screened when general population screening is not possible.

In this study we were able to determine the prevalence of G6PD deficiency in Babylon subpopulations and found the fluorescent spot test to be a simple and reliable screening tool. The spot test costs less than 3 Cents per person, making it cost-effective for use in the developing world. The one drawback of this test is that it can yield false normal results in female heterozygotes, neonates and deficient individuals who have experienced a recent episode of hemolysis. At this time, the fluorescent spot test is the most viable option for G6PD deficiency screening in Sub-Saharan Africa, but its limitations highlight the need for continued research into cheap and reliable screening methods.

The possible association between scleral icterus and G6PD deficiency discovered in this study, if confirmed in larger studies, could be used by those designing screening programs to identify children who are more likely to be G6PD deficient and should be prioritized for screening. Further research needs to be done, however, to better delineate the relationship between G6PD deficiency and other causes of hemolysis such as sickle cell disease and malaria.

The differences in the prevalence of G6PD deficiency between the ethnic groups in this study suggests that our understanding of the epidemiologic and genetic factors that contribute to G6PD deficiency in Babylon, Iraq is still incomplete. As reliable screening tests and molecular diagnostic methods become more widely available we will gain a better understanding of the origins of disease phenotype and new information about how G6PD deficiency has spread over the African continent with the movement of populations.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ministry of higher education and scientific research

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**REFERENCES**


Fractional Exhaled Nitric Oxide (FeNO) As Physiological Marker for Diagnosis and Follow up Asthma in Comparison with Spirometric Parameters

Amjed Hassan Abbas¹, Samir Sawadi Hammoud¹, Shahlaa Kh. Chabuk¹

¹College of Medicine/University of Babylon/Iraq

ABSTRACT

Bronchial asthma is one of the most common causes of chronic inflammatory respiratory diseases which is diagnosed by clinical examination and pulmonary function tests (PFTs). The FeNO test is advised in detection asthma severity and the response to inhaled corticosteroid (ICS). This study aimed to assess the benefit of FeNO test for asthmatic patients and to correlate the severity of asthma with response to ICS in comparison with spirometric parameters.

The study was performed at private spiro-clinic in Hilla city/ Iraq including 88 asthmatic patients who were given ICS for a period of 8 weeks (follow-up period) compared with 90 healthy subjects. The PFTs were measured by spirometry while the FeNO test was measured by exhaled breath analyzer (Medisoft Company, Belgium), at baseline and during follow-up visits. Results show significant differences in the mean FeNO levels in asthmatic patients in comparison with control (76.01±14.18 vs. 5.6±1.4 ppb) also there was significant decrease in the mean FeNO levels after taking ICS compared to levels before taking the treatment (14±3.2, 76.01±14.18 ppb respectively) in addition there was significant decrease in the mean FeNO levels after taking FeNO compared to levels before taking the treatment in all subgroups of severity (mild, moderate and severe) (8±1.1 vs. 19±0.7, 12±2 vs. 35±3.1 and 20±5.6 vs. 85±6.4 ppb respectively, P = 0.001). The study also showed significant increase in the mean FEV1% predicted levels after taking the treatment compared to levels before taking the treatment in all subgroups of severity (mild, moderate and severe) (94±6.7 vs. 74±7.1, 88±8.6 vs. 53±3.3 and 78±5.2 vs. 36±2.4 as percent predicted respectively, P = 0.001), also this study revealed 20:88 (22.7%) of asthmatic patients not diagnosed by spirometer while diagnosed by FeNO test. It can be concluded that this study emphasize the important role of FeNO test in diagnosis and follow up of ongoing airway inflammation and the study revealed that the FeNO test is more precise than spirometer.

Keywords: Bronchial asthma, FeNO, spirometry.

INTRODUCTION

Asthma is one of the commonest airway inflammatory disease which effects in all age group. The worldwide prevalence of this disease as reported from many various countries is 1-18% [1]. The asthmatic patients complain from variable clinical features and expiratory airflow limitations depending on the pathogenesis of underlying disease associated with different asthma phenotype [2,3]. Recently inhaled steroids were preferred on oral or injectable steroid in the treatment of asthma, because they have few side effects, improve pulmonary function and reduce symptoms and airway inflammation [4]. There was variable individual response to corticosteroids. Pulmonary function tests (PFT) parameters such as forced expiratory volume in 1 second (FEV1% predicted) are used for follow up of patients over a period of treatment [5]. Fractional exhaled nitric oxide (FeNO) is recently used to assess severity of airways inflammation and response to corticosteroids treatment [6]. There are many studies support the association between increasing FeNO level and airway inflammation in asthma together with decrease in levels after taking treatment with ICS [7-9]. Guidelines of American Thoracic Society advised use of FeNO test in investigation of asthma and...
response to inhaled steroid [10]. The aim of this study is to assess clinical use of FeNO test as a biomarker for the diagnosis of asthma and response to ICS in comparison with spirometric parameters.

**METHODOLOGY**

This study was performed at Spiro- Clinic which in Hilla city/ Iraq, it included 88 asthmatic patients who were given ICSs for a period of 8 weeks (follow-up period) compared with 90 healthy subjects, data and sample were collected according to ethical approval of ministry of environment and health in Iraq and study implemented by self- fund. The PFTs were measured using spirometry; and FeNO test was measured by exhaled breath analyzer (medisoft company, Belgium), at first visit and follow-up visits. The patients were sub-grouped according to the results of PFT and FeNO tests into mild, moderate and severe groups. FeNO levels (mild, moderate and severe) according to the following levels: if the level of FeNO < 25 ppb means mild inflammation, between 25-50 ppb means moderate inflammation and if the level > 50ppb means severe inflammation. Smoker patients and patients who do not complete the follow-up were excluded from the study.

**RESULTS**

The mean of FeNO and FEV1% predicted values in patients (before and after treatment) and control group

This study showed a significant decrease in FeNO levels after treatment in comparison with results before treatment and significant increase in FEV1% predicted after treatment in comparison with result before treatment, as illustrated in table (1).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients (NO.=88)</th>
<th>Controls (NO.=90)</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td></td>
</tr>
<tr>
<td>FeNO (ppb)</td>
<td>76.01±14.18</td>
<td>14±3.2</td>
<td>5.6±1.4</td>
</tr>
<tr>
<td>FEV1% predicted</td>
<td>45 ± 6.2</td>
<td>83±9.8</td>
<td>96 ± 5.6</td>
</tr>
</tbody>
</table>

The mean of FeNO levels in patients before and after treatment according to severity of disease

It be found in this study a significant decrease in FeNO levels at all severity levels after treatment in comparison with their levels before treatment, as shown in table (2).

Table (2): The mean ± SD of FeNO levels in patients before and after treatment with ICS according to severity of disease.

<table>
<thead>
<tr>
<th>Severity levels</th>
<th>NO.(% of patients)</th>
<th>FeNO levels (mean ± SD)</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>23(26 %)</td>
<td>19±0.7</td>
<td>8±1.1</td>
</tr>
<tr>
<td>Moderate</td>
<td>17(19%)</td>
<td>35±3.1</td>
<td>12±2</td>
</tr>
<tr>
<td>Severe</td>
<td>48(55%)</td>
<td>85±6.4</td>
<td>20±5.6</td>
</tr>
<tr>
<td>Total</td>
<td>88(100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The mean of FEV1% predicted in patients before and after treatment according to severity of disease

This study showed, a significant increase in FEV1% predicted at all severity groups after treatment in comparison with its ratio before treatment with ICS, as shown in table (3).

Table (3): The mean ± SD of FEV1% predicted in patients before and after treatment according to severity of disease.

<table>
<thead>
<tr>
<th>Severity groups</th>
<th>NO. (%)</th>
<th>FEV1% predicted (mean ± SD)</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
</tr>
<tr>
<td>Normal</td>
<td>20(22.7%)</td>
<td>96±12.3</td>
<td>97±10.9</td>
</tr>
<tr>
<td>Mild</td>
<td>18(20.5%)</td>
<td>74±7.1</td>
<td>94±6.7</td>
</tr>
<tr>
<td>Moderate</td>
<td>15(17%)</td>
<td>53±3.3</td>
<td>88±8.6</td>
</tr>
<tr>
<td>Severe</td>
<td>35(39.8%)</td>
<td>36±2.4</td>
<td>78±5.2</td>
</tr>
<tr>
<td>Total</td>
<td>88(100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparison between FeNO level and FEV1% predicted for diagnosis of asthma according to severity of disease: this study illustrated a significant increase in the number of patients that diagnosed as asthma by FeNO test rather than those diagnosed by spirometer (represented by FEV1% predicted) according to severity of disease, as shown in figure (1).

![Figure (1): Comparison between FeNO level and FEV1% predicted for diagnosis of asthma according to severity of disease.](image)

DISCUSSION

The most valuable features of FeNO test measurement are simple, informative and safe method for assessing airway inflammation, including asthma [11,12]. Other benefits for FeNO test include the noninvasive technique, easily repeated and performed in patients who have severe airways obstruction where other techniques are difficult [13,14]. By assessing bronchial inflammation, FeNO test adds a new clinical tool in addition to the traditional tools like history, physical exam, and lung function tests for diagnosis of asthma [15,16].

This study revealed significant difference in the FeNO level and FEV1% before and after treatment with ICS, this means significant decrease in the level
of inflammation in asthmatic patients after giving anti-inflammatory drugs, so the FeNO can be taken as good indicator to the level of improvement in the disease, this result was consistent with a study performed by Revathy et al. [17]. According to our information’s, this study is regarded as the first study in Iraq that use FeNO in assessment of asthma inflammation and also to predict improvement in symptoms after drug treatment, this means that FeNO can be used in diagnosis of asthma and response to treatment. This work also emphasize the role of FeNO in assessing the time for cessation of anti-inflammatory drugs like inhaled corticosteroids.

The guidelines of American Thoracic Society (ATS) and Global Initiative for Asthma (GINA) recommend the FeNO test use in diagnosis of asthma but the recommendations are not strong because difference of study reports which require further researches [17,18].

**CONCLUSION**

This study revealed that FeNO test had very important role for diagnosis and follow up of asthmatic patients and it is more precise than spirometer.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ministry of higher education and scientific research

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**REFERENCES**


15. Khalili B, Boggs PB, Shi R, Bahna SL. Discrepancy


Incidence of *Cronobacter sakazakii* in Iraqi Infants with Neonatal Sepsis

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²MBCHB DCH, Al-Basrah Teaching Hospital/Basrah/Iraq

ABSTRACT

**Background:** Neonatal sepsis is one of the main sources of morbidity and mortality in term and preterm infants. Bacterial infections are the causes of the vast majority of neonatal sepsis. *Cronobacter sakazakii* has been emerged as foodborne human pathogen and a causative agent for life-threatening bacterial infection in infants.

**Objective:** To investigate the incidence and risk factors associated with *C. sakazakii* infection in a sample of Iraqi neonates using molecular methods.

**Methods:** Venous blood was obtained from 100 neonates 1 days to 30 day-old who were admitted to AL-Imamain Al-Kadhumain Medical City, Baghdad/Iraq. After DNA was extracted from leukocytes, specific oligonucleotide primers for *C. sakazakii* were used in conventional PCR to amplify 282bp in internal transcribed spacer (ITS) between small and large subunit of ribosomal RNA gene. Association of different risk factors with the infection was determined by logistic regression test.

**Results:** Molecular methods for detection *C. sakazakii* revealed positive amplification in 16 samples (16%). Regarding prenatal risk factors results showed, six children (37.5%) positive for this bacterium had home delivery compared to only 15.47% of those who were negative. Among postnatal factors, only feeding method had a significant association with *C. sakazakii* infections where 68.75% of positive cases had received powdered infant formula (PIF) compared to 39.28% of negative cases who received such formula. Interestingly, 12 children (75%) who were positive for *C. sakazakii* have died compared with 18 (21.43%) among those who were negative for this bacterium.

**Keywords:** Cronobacter sakazakii, powdered infant formula (PIF), internal transcribed spacer (ITS), Postnatal Risk Factors, Prenatal Risk factor.

INTRODUCTION

Neonatal sepsis is the most common causes of morbidity and mortality in term and preterm infants. It contributes to more than 1.6 million deaths annually in developing countries. The reported incidence of neonatal sepsis ranges from one to five cases per 1000 live births. Bacterial infections are the causes of the vast majority of neonatal sepsis. In a recent local study, Al-Mayah *et al.* investigated a total of 150 suspected neonates from three hospitals in Baghdad. Sepsis was confirmed in 82 neonates (54.67%), with different bacteria were responsible for 81 cases (98.78%) although viral infections were excluded in this study.

*Cronobacter sakazakii* has been emerged as foodborne human pathogen and a causative agent for life-threatening bacterial infection in infants. Historically, the first isolation of these bacteria was from a baby with meningitis in 1961. Thereafter, these Gram negative, motile, bacilli were found to be associated with three distinctive pathologies in infants and premature newborns. These are neonatal sepsis, meningitis and necrotizing enterocolitis. There is almost a consensus...
between previous studies that *Cronobacter* spp. is not a normal inhabitant of mammalian body cavities, and environment is the source of infection. In this regard the bacteria were frequently isolated from different food products like salad, vegetable, minced meat and grain. What is more important for infants is the association of *C. sakazakii* infection with consumption with powdered infant formula (PIF). In their study, Jason reported that up to 90% of cases were infants who received PIF before being infected.

Globally, the outbreaks caused by these bacteria are sporadic; however, cluster outbreaks in some clinical settings have been reported. Despite this relative low incidence, the mortality rate in *Cronobacter*-induced neonatal sepsis could be as high as 80%. Moreover, the incidence of infection in less-developed countries is thought to be under-reported may be due to lack of facilities. Thus, this study aimed to investigate the incidence and risk factors associated with *C. sakazakii* infection in a sample of Iraqi neonates using molecular methods.

**Subjects and methods**

One hundred neonates with the age range from 1 to 30 days admitted to AL-Imamain Al-Kadhumain Medical City/ Baghdad/Iraq during the period January to March 2017 were recruited for this cross-sectional study. Clinical manifestations were determined by consultation of a pediatric specialist and verification of the information in the medical record. Prenatal and postnatal data were collected either by direct interview with child’s parent or from medical records. Each child’s parent has signed a consent letter.

**Sample collection and processing:**

Venous blood (3-4 ml) was obtained from each participant. The blood samples were placed in a sterile plain tube, allowed for clotting at room temperature for 30-60 minutes, and then centrifuged 1500 rpm for 5 minutes. Sera were separated, and stored at (-20°C) pending until bacterial DNA ready kit (Geneaid Total DNA Extraction/Taiwan) was used.

**Molecular detection of *Cronobacter sakazakii***

Specific oligonucleotide primers for *C. sakazakii* were used in conventional PCR. These primers were: forward 5’- GGGTTGTCTGCGAAAGCGAA-3’ and reverse 5’- GTCTTCTGCTGCGGAGTTTG13. Those primers were synthesized in Alpha DNA® (Canada), and amplifies 282bp in internal transcribed spacer (ITS) between small and large subunit of ribosomal RNA gene. PCR amplification for detection of *C. sakazakii* was optimized in a 25 μl. The reaction tube (Bioneer/Korea) was set to contain 0.4 μmol-l from each primer, DNA template (2 ng), 4 mmol MgCl2, Taq DNA polymerase (0.05 μl), and dNTPs 0.4 mmol each. PCR mixture without DNA template (non-template negative control) was employed as negative control. Thermal profile included 94°C for 2 min followed by 30 cycles of 94°C for 30 seconds, 68°C for 1 min, and 72°C for 1.5 min, with a final step of 72°C for 5 min. Ten μl of each PCR product was subjected to 1% (wt/vol) agarose gel electrophoresis with ethidium bromide (0.5 μg /ml; Sigma). Five microliters of the 100bp DNA ladder was included as a marker during PCR products electrophoresis. Amplicon visualization was performed using an UV light trans illuminator.

**Statistical Analysis**

All data were analyzed with Statistical Package for Social Sciences (SPSS) software (version 20). Binominal data were expressed as number and percentages. Logistic regression test was used to found any significant association between different risk factors and the occurrence of *C. sakazakii*. The odds ratio (OR) with its 95% confidence interval (CI) were calculated though this test to predict the effect of each risk factor on the incidence of infection. The significance was set at *p*-value < 0.05.

**RESULTS**

**Association of Prenatal Risk Factors with *C. sakazakii* Infections**

Three prenatal risk factors were investigated in this study. The only factor which significantly appeared to increase the risk of *C. sakazakii* infection was birth location. Six children (37.5%) positive for this bacterium had home delivery compared to only 15.47% of those who are negative for this infection (OR= 3.277, 95%CI=1.015-10.58, *P*=0.047). Other prenatal factor (mode of delivery and gestational age) were far from significant (Table 1).
### Table 1: Association of prenatal risk factors with *C. sakazakii* Infections

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronobacter <em>sakazakii</em> positive (16 case)</th>
<th>Cronobacter <em>sakazakii</em> negative (84 cases)</th>
<th>P-value</th>
<th>OR(95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NVD (41)</td>
<td>5 (31.25%)</td>
<td>36 (42.85%)</td>
<td>0.39</td>
<td>(Reference)</td>
</tr>
<tr>
<td>C/S (59)</td>
<td>11 (68.75%)</td>
<td>48 (57.14%)</td>
<td></td>
<td>1.656 (0.527-5.17)</td>
</tr>
<tr>
<td>Birth location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital (80)</td>
<td>10 (62.5%)</td>
<td>71 (84.52%)</td>
<td>0.047</td>
<td>1.0 (Reference)</td>
</tr>
<tr>
<td>Home (20)</td>
<td>6 (37.5%)</td>
<td>13 (15.47%)</td>
<td></td>
<td>3.277 (1.015-10.58)</td>
</tr>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full term (39)</td>
<td>7 (43.75%)</td>
<td>32 (38.09%)</td>
<td>0.606</td>
<td>1.0 (Reference)</td>
</tr>
<tr>
<td>Preterm (51)</td>
<td>9 (56.25%)</td>
<td>52 (61.9%)</td>
<td></td>
<td>0.752 (0.255-2.22)</td>
</tr>
</tbody>
</table>

NVD: normal vaginal delivery, C/S: Cesarean section, OR: odds ratio, CI: confidence interval

#### Association of Postnatal Risk Factors with *C. sakazakii* Infections

Among five investigate postnatal factors, only feeding method had a significant association with *C. sakazakii* infections. There was higher percentage of babies who received PIF in *C. sakazakii*-positive group compared to *C. sakazakii*-negative group (68.75% vs. 39.28%) with a significant difference (OR=3.4, CI=1.083-10.676, P=0.036). Other factors, particularly sepsis onset and gender although showed notable differences between *C. sakazakii*-positive and -negative groups, these differences did not rise to significant levels. Late sepsis onset was reported in 11 children (68.75%) from *C. sakazakii*-positive group compared to 57(41.67%) children among *C. sakazakii*-negative group. On the other hand, three quarters of *C. sakazakii*-positive children were male compared to 61.9% among *C. sakazakii*-negative group (Table 2).

Interestingly, 12 children (75%) who were positive for *C. sakazakii* have died compared with 18 (21.43%) among those who were negative for this bacterium (P<0.001).

### Table 2: Association of postnatal risk factors with *C. sakazakii* Infections

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronobacter <em>sakazakii</em> positive (16 case)</th>
<th>Cronobacter <em>sakazakii</em> negative (84 cases)</th>
<th>P-value</th>
<th>OR(95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast (56)</td>
<td>5 (31.25%)</td>
<td>51 (60.71%)</td>
<td>0.036</td>
<td>3.4 (1.083-10.676)</td>
</tr>
<tr>
<td>PIF (44)</td>
<td>11(68.75%)</td>
<td>33 (39.28%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis onset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early onset (32)</td>
<td>5 (31.25%)</td>
<td>27 (58.33%)</td>
<td>0.944</td>
<td>1.042 (0.329-3.298)</td>
</tr>
<tr>
<td>Late onset (68)</td>
<td>11(68.75%)</td>
<td>57 (41.67%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (45)</td>
<td>5 (31.25%)</td>
<td>40 (47.61%)</td>
<td>0.234</td>
<td>2 (0.639-6.257)</td>
</tr>
<tr>
<td>Low (55)</td>
<td>11(68.75%)</td>
<td>44 (52.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (94)</td>
<td>14 (87.5%)</td>
<td>80 (95.24%)</td>
<td>0.25</td>
<td>2.857 (0.477-17.11)</td>
</tr>
<tr>
<td>Yes (6)</td>
<td>2 (12.5%)</td>
<td>4 (4.76%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (64)</td>
<td>12 (75%)</td>
<td>52 (61.9%)</td>
<td>0.306</td>
<td>0.322 (0.161-1.824)</td>
</tr>
<tr>
<td>Female (36)</td>
<td>4 (25%)</td>
<td>32 (38.1%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OR: odds ratio, CI: confidence interval, PIF: powdered infant formula

DISCUSSION

To the best of our knowledge, this is the first study in Iraq which dealt with clinical samples for molecular detection of *C. sakazakii* in newborns. There are some local previous studies which isolated and characterized these bacteria from food samples. 13-15

According to the result of the study, 16% of neonatal sepsis are attributed to infection with *C. sakazakii* which is a relatively very high percentage compared with the global incidence of this type of bacteria. Although there were no international studies with similar design, it can be concluded form the other studies a rare or very low incidence. 16-17. Two explanations could be assumed for this high rate of incidence in the current study. Firstly, there are some false-positive results because the study entirely depended on molecular detection, rather than culturing and biochemical testing. In this regard, the primers were designed for amplification of internal transcribed spacers of 16S–23S rDNA and can be used to differentiate between closely related organisms. However, the authors designed a battery of primers to detect very low number of *C. sakazakii* in PIF samples, and there were no enough facilities to employ all these primers. Secondly there is hazardous source and predisposing factors for *C. sakazakii* infection in neonates especially there are some reports which indicated underreporting of this type of infection in less developed countries. 12. It seems that both explanations have their role in this high incidence rate.

The current series revealed home birth as a significant risk factor that increase the incidence of *C. sakazakii* infection (OR= 3.277, 95%CI=1.015-10.58, P=0.047), which implies that infant born at home has 3.277-fold risk to be infected with *C. sakazakii* compared with infant born at the hospital. In the same context, several studies emphasized that such practices are considered prominent risk factors for neonatal sepsis in general. 18-20. Delivery at home usually implies using unsterile settings which increase the exposure of the newborn to different types of infections especially with capsulated bacteria like *C. sakazakii* as it will be explained latter in this discussion. In contrast, the current study did not show any role for preterm parturition in the infection; a risk factor which frequently indicated in previous studies. 21. This result may be attributed to the high rate of preterm newborns in *C. sakazakii*-negative groups too, which made the association non-significance.

The most interesting result in the current study is the significant association between PIF feeding and the incidence of *C. sakazakii* infection (OR=3.4, CI=1.083-10.676, P=0.036). That means newborn receiving PIF will be at 3.4-fold risk to have *C. sakazakii* compared to newborn receiving only breastfeeding. This result confirms the result of large number of previous studies about the importance of PIF as a carrier for *C. sakazakii*. 22-24. As this association became a matter of fact, recent studies shed a light on some features that enable *C. sakazakii* to survive in a relatively harsh environment and to cause septicemia and meningitis in infected child.

These features can be divided into two categories: those associated with the bacteria themselves, and those related to PIF. *C. sakazakii* is known to have a hetero-polysaccharide capsule the renders the bacteria resistant to desiccation. Some reports suggested a two-year survival of the bacteria in PIF thanks for this capsule. The other feature is the ability of the bacteria to resist acidic pH. Not only is highly acidity resistible by *C. sakazakii* but also it induces bacteria to tolerate heat and other adverse conditions. The mechanism by which these bacteria can resist acidic medium is not fully understood, but it may involve the production of acid shock protein or changing in fatty acid composition of the cell wall. 25. Finally, *Cronobacter* spp. tends to attach easily and form biofilms on hydrophobic surfaces like plastics, which means that plastic feeding bottles can facilitate the bacterial growth. It is noteworthy in this regard to indicate that *C. sakazakii* generates an endotoxin that enable it to cross the blood brain barrier, and cause meningitis.

Finally, the current series showed high mortality rate (75%) in *C. sakazakii*-positive children compared with those who were *C. sakazakii*-negative (21.43%). In fact, previous studies all over the world suggested mortality rates range from 42 to 80% for neonatal meningitis and 15 to 25% for septicemia. 26. Accordingly, it is reasonable to assume that most cases in this series have developed meningitis beside septicemia.

CONCLUSION

These data strongly indicate the importance of *C.
sakazakii as a cause of sepsis in Iraqi neonates. Powdered infant formula as well as home delivery is important sources for infant infection with these bacteria.

**Ethical Clearance:** The Research Ethical Committee at College of Medicine of Al-Nahrain University approved the study.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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The Relationship between Febrile Seizure and Iron Deficiency Anemia In Babylon Children, Babylon Province

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ABSTRACT

Febrile Seizure is the most common neurological problem that occurs in children mostly between the age of 9 months and 5 years. It is emotionally traumatic for parents.

Present study aims to determine the relationship between febrile seizure and iron deficiency in children and to take attention to treat it. Two groups of 56 children in each of nine months to five-years old febrile children when they are admitted to Babylon teaching hospital for maternity and pediatrics, from 1 December 2015 to 30 June 2016. The 1st group (the cases) included children with febrile convulsion and the 2nd group (the control group) included febrile children without convulsion. Blood sample was drawn from all children to measure complete blood count, indices (PCV, MCV, RDW), serum ferritin and TIBC (total iron binding capacity). Chi-squared was used to determine the significance of difference of variables in the two groups. The results showed that iron deficiency anemia was identified in cases significantly more than its presence in control group (P-value=0.008) with odd ratio=4.08 CI (1.377-12.089).

From this result it can be concluded that iron deficiency is considered a significant risk factors for febrile seizure.

Keywords: Febrile Seizure, children, iron deficiency, neurological problem.

INTRODUCTION

Febrile Seizure (FS) is a common neurological problem that occurs during infancy and childhood periods mainly between 9 month and 5 year of age, a peak incidence is between 14-18 month of age. The temperature is 38°C or more, which not result from central nervous system insult, and which occurs without a history of previous afebrile convulsion. The National Institutes of Health defines it as an event in infants and children’s usually occurring but without evidence of intracranial infections or defined causes for their seizures. This seizure most commonly happens below the age of seven years; as they grow up the convulsions are no longer likely to be occurred in the course of a fever. In Finland, the estimated incidence rate was 6.9% up to the age of four years. Approximately thirty to forty percent of children who experience a febrile convulsion will have recurrence.

Anemia which result from iron deficiency is considered the most common type of nutritional disorders affecting at least 1/3 of the total population of the world. Usually occurs between the age of nine to twenty four months, and this period is matching with the peak incidence of febrile convulsion. Iron plays an important role in many physiological functions of neurotransmitters. Many enzymes of the nervous system are dependent on iron for their proper activities. It has been determined that iron deficiency is associated with unpleasant side effects on neuro cognitive functions of children, and may lead to psychomotor impairment and behavioral changes. Also iron depletion increases the sensitivity of neural cells during a febrile periods. Therefore, it may lead to neurological disturbances in children like febrile seizures.

METHODOLOGY

Study design and setting: A case-control study had been carried out at Babylon teaching hospital for maternity and pediatrics, Babylon province. In the emergency unit and pediatric wards from the period between 1 December 2015 to 30 June, 2016.

Case group: Fifty six children admitted to emergency unit and pediatric wards with FS, their ages ranged from 9 months to 5 years. They had temperature of 38°C or more without history of previous afebrile
seizure attacks.

**Control group:** Control group included 56 children (9 months - 5 years of age), had, visited Babylon teaching hospital during same period of the study. They had a temperature of 38°C or more without fit. They attended emergency unit and pediatric wards for URTI, gastroenteritis, UTI or nonspecific causes of fever.

Data collection; data collected according to ethical approval of ministry of environment and health in Iraq, these included Name, sex, age, date of admission, number of fits, associated symptoms, family history (in the first & second degree relatives) of febrile convulsion and feeding history.

**Information regarding the examination:** All patients submitted to full clinical examination generally, Vital signs (HR, RR, BP). Temperature measured axillary by thermometer and record by adding 0.5º to it.

**Investigation:** 2 blood samples were taken first one(1cc) with EDTA for evaluating CBC (Complete Blood Count).Second one(4cc) clotted blood for evaluating Serum ferritin and TIBC, CBC and MCV measured directly using automated blood counters Serum ferritin determined by automated quantitative test by VIDAS instrument using ELFA (Enzyme Linked Floresent Assay), while TIBC measured by using in spectrophotometric techniques, the Kit mead in France. Blood indices (PCV, MCV, RDW, S. ferritin, TIBC) were used to diagnosis of IDA.

**Diagnosis of Iron Deficiency** A child consider to have iron deficiency anemia when his mean corpuscular volume (MCV) < 70 fl who aged < 2 years and < 73 who aged >= 2 years. RDW > 14.5%, SF < 30 in present of infection. (As an acute phase protein, SF increases by acute or chronic inflammation) and TIBC > 71.6 Mmol/L.

Anemia was diagnosed when the PCV was < 33% for who aged < 2 years and < 34% who aged >= 2 years. We choose these values as our diagnostic threshold as these are acceptable age appropriate values (11). Because RDW values differ between laboratories, therefore we depend the cut off value which was determined by the local laboratory; with the lowest accepted value being 11.5%. And we use 14.5% as the upper limit of norm for RDW.

**Exclusion criteria**

- Past history of hereditary blood disorder like hemoglobinopathies
- History of disease of neurological system such as epilepsy or delayed milestone
- Age below 9 months and above 5 years
- Cases of CNS infection: They are excluded, depending on clinical features (drowsiness, irritability, neck stiffness, tense fontanel, headache, depressed level of consciousness). And/or positive laboratory tests.
- Patient with electrolyte imbalance.

**Statistical analysis** Statistical analysis was done using SPSS software version 16. Chi square and goodness of fit tests were used to compare proportion between 2 or more discrete variables. at P-value below 0.05.

**RESULTS**

Highly significant association was found between febrile convulsion and iron deficiency anemia, the number of patient with IDA in FS patient were 16 child (28.6%) combers with 5 children (8.9%) in control as shown in table (1).

**TABLE (1): Association between FS and IDA.**

<table>
<thead>
<tr>
<th></th>
<th>Case No.</th>
<th>Percentage %</th>
<th>Control No.</th>
<th>Percentage %</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDA</td>
<td>16</td>
<td>(28.6%)</td>
<td>5</td>
<td>(8.9%)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>No IDA</td>
<td>40</td>
<td>(71.4%)</td>
<td>51</td>
<td>(91.1%)</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>TOTAL</td>
<td>56</td>
<td>(100%)</td>
<td>56</td>
<td>(100%)</td>
<td></td>
</tr>
</tbody>
</table>

P-value=0.008     Odd Ratio=4.08.


DISCUSSION

In this study, it was found significant differences between cases and control regarding number of patients had IDA by measuring blood indices (PCV, MCV, and(RDW), TIBC and serum Ferritin level. This result similar to the results of Idro R. in Uganda (2010), Kumari PL in India, Sherjil Ain Pakistan (2010 ), Benjamin G. (2011), Pisacane in Italy (1996), Batieha in Jordan (2002) and Rehman in Pakistan (2005) (12, 13, 10, 5, 14, 15, 16), and can be explained by Many of the nervous system enzymes are iron-dependent for their proper activities. And iron deficiency increases the sensitivity of neural cells during a febrile episode (1, 7).

CONCLUSIONS

We conclude that The iron deficiency anemia is an important risk factor in febrile convulsions.

Conflict of Interest: There is no conflict of interest

Funding: Self-funding for implemented study.

REFERENCES


Evaluation the Tensile Strength of Cold-Cured Acrylic Resin Denture Base Material by Adding Silver Nanoparticles

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¹Department of Prosthodontics, ²Basic Science Department, ³Department of P.O.P., College of Dentistry, University of Kufa, Najaf, Iraq

ABSTRACT

Acrylic resin (material of choice for complete denture base) was subjected to recurrent fracture during clinical use of patient due to its poor mechanical strength, and this lead to short clinical implementation of dentures. This work targeted to reinforce of cold-cured acrylic resin considered as fracture repairing denture base materials, reinforced with silver nanoparticles. Silver nanoparticles (Ag NPs) with different builds and sizes were chemically prepared by chemical reduction technique, the structural and morphological properties were characterized by (SEM) and UV-Vis spectra. SEM revealed the modest size of silver nanoparticles (ranging from 50.7-55 NM). Samples of current study, twenty of prepared samples grouped into two sets. The one set (group A) composed of acrylic resin without Ag NPs and another set (group B); acrylic resin blended with 2wt. % of Ag NPs. The tensile strength of the two sets was performed by universal testing machine. The Results show High significant difference in tensile strength occurred with the incorporation of 2% wt. Silver nanoparticles. It can be concluded that the addition of silver nanoparticles to cold cure acrylic resin material improves the tensile strength of cold-cure acrylic resin, therefore increase clinical service life of the fractured acrylic appliance.

Keywords: Cold cured acrylic resin, silver nanoparticles, tensile strength.

INTRODUCTION

Silver salts have been utilized for many years ago, because of their antimicrobial efficiency against gram-positive bacteria, gram-negative, protozoa and fungi, as well as viruses [1]. At present, the silver and associated compounds are applied to reduce the risk of infection in the treatment of burns, prevent bacterial colonization of medical devices, surgical weave, and water purification, bone blocks of cement, dental materials [1-4]. In dental applications, various forms of silver such as silver ions (Ag +) and silver nanoparticles (Ag NPs) have been applied where, among various nano-fillers available the silver nanoparticles are the most widely used nanoparticles due to ductility, electrical conductivity, thermal and antimicrobial activity [5, 6].

Heat-cured acrylic resin has been the extensively utilized material of denture base for long time ago. However, the mechanical strength of acrylic resin is not sufficient for long-term clinical performance of dentures. Therefore, fracture is a common clinical event, which is often discovered in denture base midline [7, 8].

These cracks frequently refer to the ill fit of denture base, non-balanced occlusion, defect in the denture manufacture and design, the low resistance of the repair material, largely like the inherent stress in the base of the teeth, which occur over time [9, 10]. In recent studies, fracture rate was reported to be 64% and 68% [11, 12]. Since manufacturing of a new denture is time-consuming and costly for patients, denture repair is considered an option. Repaired dentures should have adequate strength, dimensional stability [9, 10, 13, 14], and color match [6, 10, 13-16]; moreover, the repair should be easily and quickly performed [10, 14, 17] and must be affordable. Amongst various methods offered for repairing fractured denture bases, utilize of cold-cured acrylic resins, which usually permits simple and fast repair, is considered the most

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extensively manner. Heat-polymerized substances have been proven to possess super mechanical properties, compared to auto polymerization materials [11, 18, 19]. Nevertheless, lab packing and flasking procedures are time-wasting and are linked with the risk of denture deformation by heat [7]. Accordingly, cold-cured resin has gained more popularity due to its comfortable manipulation, saving chairside time, and not requiring laboratory processing.

The effects of fabrics enhance and surface treatment on the flexural strength of repairing dentures have been investigated in different studies [20-22].

The purpose of this work was to look into the effect of silver nanoparticles on the tensile strength of cold-cured poly methyl methacrylate.

**MATERIALS AND METHOD**

At the beginning, the proportional amount of acrylic resin powder (Vertex, Netherlands) and Ag NPs was used in this work and its measured by a precise numerical weighing machine and blended in an amalgamator to reach a homogenous mix.

The method employed in this study follow ISO527:2000 [23] denture base resins standardization. The specimens dimension was 20×2 (±0.02) × 0.2 (±0.02) Cm for tensile strength. The specimens composed of the following two sets, each with 10 samples.

- Vertex without (0%) Ag NPs (control group).
- Vertex with 2% of Ag NPs (study group).

The samples were prepared according to the order of manufacture instruction, and include blending liquid and powder (premixed powder with the Ag NPs regarding study group) of cold acrylic and packing in a prepared plastic mold made according to the above mentioned standardization. The rectangular cube samples were putted in the relevant points along with the universal test machine (figure 1) and firmed from both ends of a sample by jaws of the machine. Tensile stress device (N) start with tensile action at a rate of 1 mm/min on each sample until fracture of the sample. The force was recorded at break time, given the cross-sectional area of each sample, the bond tensile strength was calculated on a mega-pascal using the following formula: tensile strength (MPa) = Forceamount (N) /Cross-section area (mm²)

![Figure 1: Universal testing machine and sample during testing](image)

After analyzing the all samples in both groups (1 and 2), and their tensile strength was also taped. After the data collection, statistical analysis was done by SPSS (SPSS Inc. Chicago, IL, USA), utilizing the T-test. A Statistical significance was determined as P value.

Silver nanoparticles was synthesized by the chemical reduction method. 1mM of silver nitrate (AgNO3) was heated to 60C and the solution stirred with a magnetic stirrer bar for 30min. 9mL of Sodium Hydroxide (NaOH), which used as a reducing agent, was added to solution drop by drop, about 1 drop per second. Then wait for the colorless solution to change to pale yellow color which indicated the formation of silver NPs. After cooling to the temperature of a room, the molecules were detached by centrifugation (40000 RPM) for 5min and it was washed with distilled water to get rid of any pollution, and then the particles are dried in the oven at 80 ° C.

All experiment performed according to LAB lows of ministry of higher education and scientific research.

**RESULTS**

The Size, shape and morphology of Ag NPs were characterized by Scanning electron microscope (SEM), the nanoparticles have spherical shape, the structure of Ag NPs distributed uniformly with an average diameter (55nm) as exemplified in figure 2. This result good agree with [24].
Figure 3 exhibits 3D AFM image and granularity accumulation of the Ag NPs deposited by drop casting on glass substrate, the average grain size of the prepared sample was 50nm.

Approving the UV-visible absorption spectra of NPS has a UV absorption band with a peak focusing on NM 335 (Figure 4). Spherical Ag nanoparticles with diameters 50nm show a plasmonic resonance in the UV-Vis spectra.

Averages (means) and standard deviations recorded of the tensile resistance for both groups. The highest mean value of tensile resistance of the two groups was present in group 2. The addition of 2 wt. % Ag NPs to vertex statistically and according to T-test high significantly raised the tensile resistance where a P value was 0.000 (Figure 2 and Table 1).

**Table 1. Statistical data of tensile strength (MPa) in two groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>T-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>10</td>
<td>16.72</td>
<td>0.54</td>
<td>-22.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Group 2</td>
<td>10</td>
<td>21.51</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Morphology of Ag NPs by using SEM

Figure 4: UV absorption spectra of Ag NPs solution
DISCUSSION

Study aimed primarily to evaluate possible betterment in cold PMMA mechanical properties, particularly, tensile strength, in addition, the unmodified Ag NPs powder.

There are two methods to enhance the PMMA mechanical properties: chemically modifying it; and reinforcing the PMMA with other fabrics. All the same, the high costs of what belong to chemical modification and process of preparing, and manipulation of filler (fabrics) as reinforcing materials may be unpractical for dental offices (25, 26). The conventional heat PMMA (without improvement) undergone to frequent fracture and repaired by cold PMMA, and in this work, we undertake to reinforce of repairing materials in simple method by Ag NPs were mixed right away with powder of cold PMMA in amalgamator.

Adding modified or unmodified particles of ceramic to improving denture bases acrylic resin is a debatable issue, there are no definitive answers to the preference of one particle to another (27-29). Nevertheless, the present work demonstrated that addition of 2wt. % of unmodified Ag NPs to a cold-cured resin enhanced the tensile strength of it without additional processing steps necessary. Consequently, to repair broken dentures by this method is not a waste of time, which would encourage to utilize it in a routine manner in dental laboratories because of its low price, simple of processing and handling.

Agreeing to this study the tensile strength increased highly significantly of experimental group when compared with the control group, suggested that nanotechnology-assisted design allows a product with well-controlled morphology. As well may be imputable to that addition of Ag NPs particles to cold cured PMMA, Subsequently, not subjected to hot water bath curing of heat cured PMMA and this enables the nanoparticles to save essential heretical properties without change by high curing temperature. Also, the tiny size, high surface area and comparatively low percentage of nano filler may assist in a good diffusion of these fillers in a polymer matrix that may lead a limited motion of polymer chains and improve mechanical properties. These effects are coherent with previous studies (30, 31).

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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Effect of *Rose Demascena* Extracts in Prolonging the Duration of the Preservation of Yoghurt

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¹Market Research and Consumer Production Center¹University of Baghdad/Iraq

**ABSTRACT**

The importance of food as food additives for this plant syphilis because of the characteristics of life and chemical, which can be positively reflected on the health status of the consumer after adding it as extracts or as drying flowers to yoghurt, which is one of the dairy products as an important food consumed from all human age groups. In this study, a number of cold water extracts were prepared (R1), yoghurt with 2% cold water extract, R² yoghurt with 4% cold water extract (R³) yoghurt with 6% cold water extract. The oil extracts consisted of (R⁴) yoghurt with the addition of oil extract 2%, R⁵ yoghurt with the addition of oil extract by 4%, R⁶ yoghurt enriched with the addition of oil extract 6%. Important active compounds that are conservation the studied samples were detected. such as tannins, soap, flavonoids, alkaloids, turines and steroids, as well as the presence of volatile oil and used the infrared spectroscopy technique FTIR-8300 Fourier Transform Infra-Red Spectrophotometer. Sensory tests were conducted for the yogurt samples added to the Rosa sp. extract.

It can be concluded that the addition of a specific percentage of the Rosa sp. extract to the sample of the study, the yoghurt and for different periods of time, led to stopping and sometimes curbing the biological effectiveness of bacterial growth which is under study. As well as the addition of both water extracts and oil extract has a positive effect in maintaining the qualitative and sensory characteristics and increase the time period of prolongation of the preservation of yogurt during cold storage.

**Keyword:** Yogurt prolongation, antimicrobial activity, water extraction, sensory characteristics.

**INTRODUCTION**

Rose is one of the most common floral plants and spread in public gardens and household, because of the beauty of flowers, colorful colors, fine smell, as well as the possibility of picking flower, transport and trade because it enters in many food processing as a residue of taste or flavor or smell, as well as the basic component in the manufacture of fragrances, perfumes, cosmetics and various decorative properties

This species belongs to the Rosaceae family and includes about 200 species, the most important of which are Shami roses, French roses, Indian roses, etc., distributed widely in Europe, Asia, the East Middle and North America.

*Rosacea L.* is a member of the family with its rich content of minerals, vitamins, sugars and 300 biologically effective organic compounds, these are aromatic acids, organic acids, flavonoids, alkaloids, glycosides, phenols, Saponins, tocopherols and carotenoids, which are stable, whether in the plant as a whole or its seeds or petals.

The proportions of these compounds differ from one plant to another and from one member to another. The same plant works as microbial and viral antibiotics and antioxidants, it is also widely used in medical and pharmaceutical purposes, including intestinal disorders, intestinal dysfunction, head and back pain, and laxative treatment in both intravenous and exogenous tests.

Studies and researches conducted at the University of New Jersey indicate that essential rose oils have a calming effect on the nerves and an antidepressant that makes the person able to communicate with others because of their containment of special chemical compounds, these oils take their way to human body through the skin or inhalation and its important properties
affect one the brain cells specialized in memory and emotions, making a remarkable improvement in both the body and the emotions also have the ability to remove tension and depression. It was also found to have an effect greater than the effect of Philodendron, which is used in the treatment of psychological conditions such as stress and depression, as well as its strong effectiveness towards certain types of microbiology [8, 9].

This study came in order to draw attention to this plant of syphilis to enjoy the characteristics of life and chemical, which can be reflected positively on the health status of the consumer after adding it as extracts or after drying flowers and added to the yoghurt as an important food consuming from all age groups of humans as the main source to provide the body with essential unsaturated fatty acids as well as the high value of proteins [10].

Note that the current study to our knowledge is the first experience in Iraq to discuss the effect of adding roses, Effective compounds to yoghurt.

MATERIALS AND METHOD

plant samples: The plant samples were obtained from petals by collecting flowers in the morning at the Gardens of Baghdad University (Al-Jadriya Complex) in late March and early April 2017. Then the petals were taken from the Lord and washed with distilled water to free them from dust. And its impurities were divided into two groups. The first was kept in clean, sealed glass containers and coated with aluminum foil in a refrigerated storage method using the refrigerator temperature until it was used, and then cut by a clean knife into small pieces before the extraction process was carried out in minutes. Salvation in order to preserve its oil pilot, all experiment implemented according to the LABs low of ministry of higher education and scientific research.

Preparation of plant extracts

1. Cold water extract Following the method mentioned [11], weighing 100 grams of petals after cutting into small parts and placed in a glass flask of one liter and add 500 ml of distilled water and leave the mixture for 24 hours in the incubator at a temperature of 35 m. The sample was left to settle for an hour and then was sprayed with three layers of gauze cloth to separate the hard plankton and was sedimented using a centrifuge and at 3000 cycles / min for 10 minutes to separate the small plankton, collecting the sparkles and concentrating on the Rotary Evaporator and drying the oven at 45 ° C, For dry powder, keep in a dark, clean and dark glass bottle in the refrigerator until use.

2. Oil Extract: To prepare the oil extract of the Lord of the Juris, follow the method described [12] with some modifications involving the separation of oil pilot after extracting from the rest of the extracted materials in rose water by saline separation by salt at 1% Where the top oil layer was seen towed in a sterile syringe and stored in a clean, sealed glass bottle that was kept in the refrigerator until use. The process of extracting the oil was done by weighing 200 grams of petals cut into small pieces in the Clevenger steam extractor after adding 500 ml of distilled water. The extraction process continued for four days and four hours per day. Of the pilot oil in the petals, then underwent the process of modification mentioned earlier.

Specific chemical analyzes of active compounds; A number of qualitative tests were carried out on the powder of the two extractors in the previous paragraphs separately. A solution of the petal extract was studied with a weight of 10 grams, with 50 ml of sterilized distilled water, heated to the boiling tray, then filtered and left to be cooled and placed in Baker [13] which includes the detection of tannins, soap, flavonoids, alkaloids and clays, as well as terpenes and steroids. In the case of volatile oils, they were detected using the method of work in [14] which depends on the presence of oil Pilot through the emergence of a bright pink color after exposing the leaves of filtration saturated with water and algae extracts to ultraviolet radiation, The FTIR-8300 Fourier Transform Infrared Infra-Red Spectrophotometer (SHIMADZU), which is widely used for quantitative and qualitative diagnostics, has been used to determine the active groups in these extracts. The pH value of the plant solution was also calculated according to the method of work [15] using a pH meter at laboratory temperature.

The manufacture of yoghurt: The method of manufacture of Yoghurt manufacturing laboratory was followed by the method of work provided by [16, 17] with some modifications after purification by a cloth of the saline, and was divided into seven parameters After leaving the first treatment without any addition (control treatment), add the water extract to three parameters of
2%, 4% and 6% and the oil extract to the other three with the same proportions as shown in Table (1).

### Table (1) yoghurt treatments with different concentrations of water and oil extract

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Symbol</th>
<th>Describing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control treatment</td>
<td>C</td>
<td>Yoghurt without addition</td>
</tr>
<tr>
<td>Water extraction</td>
<td>R1</td>
<td>Yoghurt + water extract 2%</td>
</tr>
<tr>
<td>Water extraction</td>
<td>R2</td>
<td>Yoghurt + water extract 4%</td>
</tr>
<tr>
<td>Water extraction</td>
<td>R3</td>
<td>Yoghurt + water extract 6%</td>
</tr>
<tr>
<td>Oil extraction</td>
<td>R4</td>
<td>Yoghurt + oil extract 2%</td>
</tr>
<tr>
<td>Oil extraction</td>
<td>R5</td>
<td>Yoghurt + oil extract 4%</td>
</tr>
<tr>
<td>Oil extraction</td>
<td>R6</td>
<td>Yoghurt + oil extract 6%</td>
</tr>
</tbody>
</table>

The process of naturalization of milk control treatment, while mixing the models of transactions with the electric mixer to ensure the full mixing of the extracts with milk and heated at a temperature of 92 m for 15 minutes and then cooled to a temperature of 42 m and was then followed by milk and direct addition and quantity indicated by the French company Danisco Produced by 0.00209%, and packaged in clean plastic containers of 200 ml and then incubated at 42 ° C for 4.5 hours until full coagulation decreased pH to 4.6 and then transferred from the incubator to the refrigerator for cooling and preservation at a temperature of ± 1 ° 5 until completion of the tests The crisis is over Passing 0, 3, 7th, 9th days.

**Bacteriological tests**: to determine the effect of the addition of gourd extract on the duration of the storage of the milk powder, underwent a series of bacteriological tests, where the method of work obtained in [18] adopted the appropriate decimal method to estimate the quality of bacteriological, where the total number of bacteria and air bacteria Coliform bacterium, Yeast and mold as stated in [19].

**Sensory Evaluation**: Sensory tests of the milk samples were carried out by a number of specialized professors and researchers at the Center for Market Research and Consumer Protection at the University of Baghdad and according to the sensory evaluation form established by [20]. The color, appearance, flavor, smell and general acceptance were assessed in a scale of 1-10 points (1-2 = very weak, 3-4 = weak, 5-6 = average, 7-8 = good, 9-10 = Excellent).

**Statistical analysis**: The statistical program SAS was used to analyze the results obtained. Morale differences were compared with the least significant difference (LSD) probability (P <0.05), as indicated by [21].

### RESULTS AND DISCUSSION

The results of the qualitative detection of the chemical compounds of the water and oleander extract were shown in table (2) with the presence of chemical compounds such as tannin, soap, flavonoids, alkaloids, turines and steroid, as well as the presence of pilot oil, These substances are very effective, while each of them also gave a negative result for the examination of the glycosides [22].

### Table (2) Results of chemical analyzes of active compounds in Rosa damascena extracts.

<table>
<thead>
<tr>
<th>Active compounds</th>
<th>Water extract</th>
<th>Oil extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tannins</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Soaps</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Turines</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Claysides</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Steroids</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Volatile oil</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>PH</td>
<td>5.7</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Table 2 shows It is noted that the extracts were acidic acid and this is a very important feature in reducing the number of bacteria and prolongation of storage time because it eliminates the majority of microbiological organisms that favor pH 7.2, as well as fungi that prefer growth at pH 6.5, Thus inhibiting their growth due to their low biological activity related to their metabolic enzymes [23, 13].

The results of the FT-IR test of the Jury extract showed that each material has a functional range at a certain wavelength. These functional groups have distinct absorption characteristics that are relatively
unchanged at these wavelengths, thus identifying the functional groups of both the water and oil extract. Show similarity and convergence in terms of their containment on the same active groups (Figs.1, Table 2). The OH group appeared at absorption between 3000 and 3506 while the group of amines C = N was between 2200 and 2400. The whole group C = O and C = C were shown at the absorption of 1902-2094 and 1301 to 1641 respectively. The addition of the single aster set C-O-C with absorbance 820 to 1235, and another uptake of between 402 and 760. This value indicates only the existence of effective aromatic aggregates. Thus, these results coincided with the specific chemical tests (Table 2) and agreed with the results mentioned in [13].

![FTIR spectrum analysis curve for Rosa demascena water extract.](image_url)

**PH Value**

Table (3) shows the pH value of the fermented milk treatments added to the gourd extract during refrigerant storage at 4 °C. The pH values during the first day after processing ranged from 4.53 to 4.56, which is consistent with both [24] and [25] who pointed out that the value of the pH of coffee curd at the first day of manufacturing amounted to 4.58 and 4.59, respectively. PH values began to decrease gradually during cold storage to reach a minimum of 4.40 in R6 after 14 days and a maximum of 4.45 in treatment C, and agreed with the results mentioned [26]. The reason for the reduction in pH was attributed to the continued activity of the Bacteria during cold storage. The results of pH values differed slightly from those found in [27] with pH significantly reduced by increasing the concentration of guava extract added to the curd during the fifth day of cold storage to 3.82.

**Table (3) PH value of the yoghurt treatments added to Rosa demascena the during cold storage at 4 °C**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Days of refrigerating store at 4° C</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>4.56</td>
<td>4.52</td>
</tr>
<tr>
<td>R1</td>
<td>4.56</td>
<td>4.51</td>
</tr>
<tr>
<td>R2</td>
<td>4.54</td>
<td>4.52</td>
</tr>
<tr>
<td>R3</td>
<td>4.55</td>
<td>4.49</td>
</tr>
<tr>
<td>R4</td>
<td>4.56</td>
<td>4.48</td>
</tr>
<tr>
<td>R5</td>
<td>4.54</td>
<td>4.49</td>
</tr>
<tr>
<td>R6</td>
<td>4.53</td>
<td>4.47</td>
</tr>
<tr>
<td>LSD</td>
<td>0.577 NS</td>
<td>0.631 NS</td>
</tr>
</tbody>
</table>

NS: Not significant
Sensory assessment

Table (4) the sensory of the Yogurt treatments with the addition of the Rosa demascena during the first day tile the fourteenth day of cold storage.

<table>
<thead>
<tr>
<th>Sensory Properties</th>
<th>Time (day)</th>
<th>Treatments</th>
<th>LSD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>R1</td>
<td>R2</td>
</tr>
<tr>
<td>Appearance</td>
<td>1</td>
<td>8.5</td>
<td>8.7</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>7.6</td>
<td>7.9</td>
<td>8.4</td>
</tr>
<tr>
<td>Color</td>
<td>1</td>
<td>6.9</td>
<td>7.3</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>6.5</td>
<td>7.5</td>
<td>8.6</td>
</tr>
<tr>
<td>Taste</td>
<td>1</td>
<td>7.3</td>
<td>7.6</td>
<td>8.1</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>7.1</td>
<td>7.3</td>
<td>8.6</td>
</tr>
<tr>
<td>Smell</td>
<td>1</td>
<td>6.8</td>
<td>7.2</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>6.2</td>
<td>7.5</td>
<td>7.2</td>
</tr>
<tr>
<td>General expectance</td>
<td>1</td>
<td>7.4</td>
<td>7.5</td>
<td>8.1</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>7.5</td>
<td>7.8</td>
<td>8.6</td>
</tr>
</tbody>
</table>

* (P<0.05).

The results showed that R5 and R6 for oil extract and R3 for water extract gave the highest ratings for the first two days after manufacture, 9.1, 9.2 and 8.4 respectively for appearance, 8.7, 9.5 and 9.3 for color. Evaluation of the appearance and color of all transactions, especially those mentioned on the fourteenth day of the refrigerated storage, reached to 8.7, 9.5 and 9.1 respectively for appearance, 8.7, 9.6 and 8.8 for color classification.

For the curd coffee, which is processed with the guava extract on the first day, Zen radiator to day fourteen to reach 9.1 and 8.8 respectively for the two lips.

While the results differed with what was found [28], which indicated the low evaluation of appearance and color by adding the extracts of green tea and Moringa to the yogart at the first day and continuous storage of cooled to 7.2 and 6.8 respectively for appearance and 7.5 and 6.2 respectively for color compared to treatment. The control was free of additives that reached the grade of ratings of 9.3 and 8.5, respectively. There were no significant differences among the treatments at appearance test, but we can found that there are a significant differences among all treatments that belonged to other tests such as test, color, smell and general acceptance.

The results of the taste evaluation for the yoghurt treatments added to the gourd extract were higher than R3 and R6 with the highest concentration of Jiri and Zity extracts on the first day and the 14th day of manufacture at 9.5 and 8.8 respectively for the first day, 8.7 and 9.2 respectively. For the fourteenth day. These results were similar to those of [26] and [27] in that improve the evaluation of the milk taste treated with the thermos and last plants in guava, respectively, by increasing the concentration of the added extract with continuous cold storage at the 14th day.

R3, R4, R5 and R6 showed the highest ratings of odor and general receptivity in the first and fourteenth days of cold storage and increased concentration of the extract, all of which obtained grades of 9 or more from 10 to reach the highest concentration of oil extract in treatment R6, highest in odor 9.1 and 9.5 respectively for the first two days, fourteenth, 9.4 and 9.5 respectively for the general acceptance in the same previous periods. These results were agreed with [26- 28].

Biological activity

The range of biological activity plant extract is related with the presence of active compound that were determined in this study. The study results show a significant differences at most treatments in different storage days.

The aerobic total count was tested in all treatments of the study at different time of storage and there was a significant difference among the treatments at each time of the experiments and also a significant difference
for every treatment at different storage time. This study was agree with a study by [29-31] which insure that Gram positive and negative bacteria were inhibited or killed by a specific concentration of extracts. As it showed in (table 5) both cold water extract and oil extract shows appositive effects in specific treatment against aerobic bacteria and that was related to the functional groups of these two type of extracts, this results were compatible with results by [32, 33] which evaluate the phytochemicals of Rosa sp. and their activity. [34,35]

Table (5) The contaminated aerobic bacteria for yoghurt sample at different periods of refrigerated storage.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Days of refrigerating store at 4° C</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>day 1</td>
<td>day 3</td>
</tr>
<tr>
<td>C</td>
<td>5.6×10³</td>
<td>7.8×10³</td>
</tr>
<tr>
<td>R1</td>
<td>2.1×10³</td>
<td>7.7×10³</td>
</tr>
<tr>
<td>R2</td>
<td>7.5×10²</td>
<td>8.6×10²</td>
</tr>
<tr>
<td>R3</td>
<td>6.3×10²</td>
<td>7.9×10²</td>
</tr>
<tr>
<td>R4</td>
<td>4.4×10²</td>
<td>6.5×10²</td>
</tr>
<tr>
<td>R5</td>
<td>5.3×10²</td>
<td>5.8×10²</td>
</tr>
<tr>
<td>R6</td>
<td>4.2×10²</td>
<td>4.3×10²</td>
</tr>
<tr>
<td>LSD</td>
<td>1.66 *</td>
<td>1.093 *</td>
</tr>
</tbody>
</table>

* (P<0.05).

At this study the best effect of Rosa sp. water and oil extract was found against Gram-negative bacteria, specially coliform bacteria groups and this study was in agree with a study by [36,37]. Total coliform was tested in this study and it found that there were no significant differences among treatments at storage day 1 and 3, but there were a significant differences among treatments at other tested storage days as it showed in table(6). The results showed that both extracts can give a good singe for the activity of biological and antimicrobial compounds against coliform bacteria at all treatment.

Table (6) The contaminated coliform bacteria for yoghurt sample at different periods of refrigerated storage.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Days of refrigerating store at 4° C</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>day 1</td>
<td>day 3</td>
</tr>
<tr>
<td>C</td>
<td>3.0×10¹</td>
<td>5.2×10¹</td>
</tr>
<tr>
<td>R1</td>
<td>2.5×10¹</td>
<td>4.6×10¹</td>
</tr>
<tr>
<td>R2</td>
<td>3.0×10¹</td>
<td>4.8×10¹</td>
</tr>
<tr>
<td>R3</td>
<td>2.3×10¹</td>
<td>4.5×10¹</td>
</tr>
<tr>
<td>R4</td>
<td>2.0×10¹</td>
<td>4.0×10¹</td>
</tr>
<tr>
<td>R5</td>
<td>2.2×10¹</td>
<td>3.5×10¹</td>
</tr>
<tr>
<td>R6</td>
<td>2.4×10¹</td>
<td>3.7×10¹</td>
</tr>
<tr>
<td>LSD</td>
<td>1.03 NS</td>
<td>1.89 NS</td>
</tr>
</tbody>
</table>

* (P<0.05).
The fungal tests at this study found that there were no significant differences among some treatments at different storage days as in treatment R4 and R6, but there were a significant differences among several treatments at other tested storage days table (6) shows that, also both extracts can gave a good level for the antimicrobial activity against fungal (mold and yeast) at all treatment. Several studies testing the antimicrobial and antifungal activity of extracts of Rosa sp. that shows a high antimicrobial activity due to the presence of alkanes and phenolic, this study was matching with a study by [38,39].

Table (7) The contaminated mold and yeast for yoghurt sample at different periods of refrigerated storage.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Days of refrigerating store at 4° C</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>day 1</td>
<td>day 3</td>
</tr>
<tr>
<td>C</td>
<td>0.0×10⁻¹</td>
<td>2.0×10⁻²</td>
</tr>
<tr>
<td>R1</td>
<td>0.0×10⁻¹</td>
<td>3.0×10⁻²</td>
</tr>
<tr>
<td>R2</td>
<td>0.0×10⁻¹</td>
<td>1.5×10⁻²</td>
</tr>
<tr>
<td>R3</td>
<td>0.0×10⁻¹</td>
<td>0.0×10⁻¹</td>
</tr>
<tr>
<td>R4</td>
<td>0.0×10⁻¹</td>
<td>0.0×10⁻¹</td>
</tr>
<tr>
<td>R5</td>
<td>0.0×10⁻¹</td>
<td>1.5×10⁻¹</td>
</tr>
<tr>
<td>R6</td>
<td>0.0×10⁻¹</td>
<td>0.0×10⁻¹</td>
</tr>
<tr>
<td>LSD</td>
<td>0.00 NS</td>
<td>1.07 *</td>
</tr>
</tbody>
</table>

* (P<0.05).

The variation in antibacterial and antifungal activity noticed at these study experiments is very interesting knowledge for the selection of plant material to be used in food production, health industry and future bioremediation programs.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

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Molecular Characterization of *Echinococcus granulosus* In Iraq using Cal and efla genes

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**ABSTRACT**

Cystic echinococcosis (CE) is one of the most important zoonotic disease, Worldwide including Iraq. The recent molecular phylogeny of genus echinococcus revealed, *E. granulosus sensu strictu* (G1, G2, and G3) genotype complex is a highly infectious to human and animals. This study identifies the genotypes of echinococcus parasite infecting human and livestock in Iraq. Thirty three isolates collected from sheep, goat and human were detected by PCR targeting mitochondrial elongation factor1alpha (Efla) and carlreticulin (Cal) genes. Sequence comparison showed DNA fragments obtained were amplified from partial cal gene ,when shared 99% maximum nucleotide identity with equivalent GenBank sequences from Estonia (Acc. Codes EU834932 and EU834931) France / Spain and multiple origins (Acc. codes KY766909 and KY766910). Whereas, other sequences shared 99% maximum nucleotide identity with Efla gene equivalent GenBank sequences from china (FN568380 and AB306934), Estonia (EU834898), Bulgaria (KR070993), Ethiopia (KX037021), Tunisia (KM014647) and France / Spain (KY766913 and KY766914). Efla gene scored a high incidence (97%) in detected samples compared to cal gene (76%). the current study indicated that the calreticulin (Cal) and elongation factor I alpha (Efla) genes are the most dominant in detected samples and could be the main source of infection in human and animals in Iraq.

**Keywords :** *Echinococcus granulosus*, genotyping, human, livestock, Iraq.

**INTRODUCTION**

Cystic Echinococcosis (hydatidosis) is one of the most important zoonotic diseases, worldwide world¹,² It is caused by an infection with the larval stage of *Echinococcus granulosus*. This disease causes economic losses in livestock and a high mortality in humans³,⁴ However, human is an uncommon host because the parasite life cycle cannot be completed.⁵ This disease is a highly endemic as it is continentally distributed in the Mediterranean, Eastern Europe, East and North Africa, Central Asia, China and Russia, and South America⁶,⁷,⁸.

Human CE is a public health problem with a significant economic impact in developing countries⁹ especially in rural areas where dogs and farm animals are reared together¹⁰,¹¹. WHO was included echinococcosis within 2008 - 2015 strategic program to control neglected tropical and zoonotic diseases¹².

*Echinococcus granulosus* has intra specific molecular variation based on mitochondrial and nuclear markers. A number of these variants has been identified within the *E. granulosus* species¹³. However, these genetic variations may affect many different phenotypic features such as host specificity, life cycle patterns, transmission dynamic, development rate, geographical distribution and control of the disease¹⁴.

According to the new molecular phylogeny of the genus *Echinococcus*, many studies suggested *E. granulosus* (genotypes G1–G10) are classified into 4 distinct groups including *E. granulosus sensu stricto* (G1–G3), *E. equinus* (G4), *E. ortleppi* (G5) and *E. canadensis* (G6–G10)¹⁵,¹⁶. *E. granulosus sensu stricto* is composed of three closely related genotypes (G1-G3) all of which are known to be highly infective to human¹⁷. These genotypes are identified as G1 (sheep strain), G2 (Tasmanian sheep strain), and G3 (buffalo strain). The sheep strain (G1 genotype) has the most wide geographic distribution worldwide. It is highly dominant in the Mediterranean Basin⁸,¹⁸.
Iraq is one of the countries where Cystic echinococcosis has a public health and economic impact. Different species of intermediate hosts have been recorded to be infected by *E. granulosus*. Decades ago, several studies have investigated this disease in Iraq. They were based on different biological, immunological, pathological, epidemiological, biochemical, therapeutic and histochemical aspects in Iraq 19-28. However, those based on genetic diversity and molecular characterization of *E. granulosus* strains/genotypes infecting human and livestock were limited 29-33.

The present study was conducted to investigate the molecular variations of *E. granulosus* s.l. cysts collected from sheep, goat and human in Baghdad province, based on partial sequencing of mitochondrial calreticulin (Cal) gene and Elongation factor 1 alpha (efla) gene.

**METHODOLOGY**

**Cyst Collection**: During the period of the study from October 2013 to April 2014, 263 sheep and goats were investigated for Cysts in the official slaughterhouse of AL-Shualla / Baghdad. Only intact hydatid cysts were included in sampling procedure. Human hydatid cysts were collected from patients during surgical operation performed in the medical hospital of Baghdad city. Four intact, large and fertile hydatid cysts were obtained from livers of infected humans. Samples were collected according to ethical approval of Ministry of environment and health of Iraq. Each sample collected was preserved in a cool box with sterile normal saline then transferred to Parasitology Laboratory and processed immediately under aseptic condition. Cysts were washed several times with sterile physiological (normal) saline to remove the remaining host tissue. and then they were extensively washed with 70% ethanol. To evaluate the cyst fertility, the cyst contents (fluid and protoscoleces) were aspirated aseptically with sterile disposable syringes (10 ml) into sterile flask. Protoscoleces were finally rinsed 3-4 times with sterile normal saline followed by 70% ethanol and stored at 4°C temperature for further analysis 25.

**DNA Extraction and PCR Amplification**

Materials from individual cysts were washed off ethanol with distilled water by centrifugation. DNA extraction was performed using the QIAamp DNA Mini Kit (Qiagen, Germany) following the manufacturer-recommended procedure.

**Targeted genes**: Calreticulin (Cal) and elongation factor 1 alpha (efla) genes specific to *E.granulosus* s.s. (G1/G2/G3) were amplified from isolates of (sheep, goat and human) using the following primer sets synthetized by Bioneer company. E.g ss cal (F) (5’ CAA TTT ACG GTA AAG CAT 3’), E.g ss cal (R) (5’ CCT CAT CTC CAC TCT CT 3’), and The E.g. ss (Efla) (F) (5’ TCC TAA CAT GCC TTG GTAT 3’), E.g. ss (Efla) (R) (5’ GTT ACA GCC TTG ATC ACG 16 respectively. A Fifty 50 μl reaction mixture consisted of 2x PCR Master mix buffer (Top Tag master mix kit QIAGEN, GERMANY) 10 pmol of each primer, DNA template 5ul. PCR amplification consisted of one cycle of initial denaturation for 3 minutes at 94°C, 35 cycles of denaturation for 30 sec at 94°C, annealing for 30 sec at 60°C and extension for 1 minute 72°C. The final extension step was of 10min at 72°C. PCR products were analyzed by 1.5% agarose gel electrophoresis.

**DNA sequencing and Phylogenetic analysis**: PCR products of expected size were purified using Gel/PCR DNA Fragments Extraction kit (Geneaid, Taiwan) following the manufacturer’s instructions. All amplicons were sequenced by an ABI-3730XL capillary machine (Macrogen Inc., Seoul, Gyeonggi-do, South Korea). The nucleotide sequences were aligned using MEGA6 software package 34 and compared to equivalent GenBank sequences using BLAST programs and NCBI database (National Center for Biotechnology Information, Bethesda, MD, USA). Phylogenetic analysis was performed using MEGA6 software package 34.

**RESULTS**

Examination of collected cysts from sheep and goats indicated 26 out of 87 (30%) and 3 out of 21 (14%) hydatid cysts were fertile, respectively. The investigation of cyst samples collected from patients attending different hospitals in Baghdad showed only 4 of hydatid cysts obtained from liver of infected patients were intact. They were large, fertile and contained a large number of protoscoleces. The packed volume of protoscoleces obtained ranged from 0.5-2 ml. The total fertile cysts 33 out of 112 (29%) in sheep, goat and human.

PCR amplification using *efla* and *cal* genes specific primer sets revealed, these two genes were present in all 26 (100%) and 23 out of 26 (88%) sheep cyst samples, respectively. In goat cyst samples, *efla* and *cal* genes
were present in all 3 (100%) and 1 out of 3 (33.3%). Whereas, they were present in 3 out of 4 (75%) and 1 out of 4 (25%) in human cyst samples. The efla gene showed a high gene frequency (97%) compared to cal gene with (76%) in Iraqi hydatid cysts. Genetic analyses revealed cal gene sequences obtained shared 99% maximum nucleotide identity (nt) with *E. granulosus* equivalent GenBank sequences from Estonia (Acc. no. EU834932 and EU834931) and France/Spain (Acc. no. KY766910 and KY766909).

Sequence comparison showed efla gene partial sequences amplified shared 99% maximum nucleotide identity with the equivalent *E. granulosus* GenBank sequences from China (Acc. no. FN568380 and), Estonia (Acc. no. EU834898), Bulgaria (Acc. no.KR070993) , Ethiopia (Acc. no. KX037021) and Tunisia (Acc. no. KM014647) and France/Spain (Acc. no. KY766913 and KY766914) (Table -1-).

Neighbor-Joining phylogenetic tree confirmed the relatedness when separated partial sequences obtained in two different groups based on efla and cal genes (Fig-1).

FIGURE-1- : Phylogenetic relatedness of Efla and Cal genes detected in *E. granulosus* cysts isolated from Iraq Neighbor-Joining phylogenetic tree constructed from partial nucleotide sequences of Efla and Cal genes isolated from Iraq (marked with◊) and equivalent GenBank sequences
TABLE 1. Characteristics of *Echinococcus granulosus* isolates used in this study

<table>
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<tr>
<th>Accession No</th>
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<th>Location</th>
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**DISCUSSION**

The presence of *E. granulosus sensu stricto* in human and livestock in Iraq was investigated. Similar results to those reported by previous Iraqi studies was obtained 30-33.

A little is known concerning the strain which causes human cystic echinococcosis infection in Iraq. Molecular analysis confirmed that all human cysts collected belonged to *E. granulosus* genotype G1 (common sheep strain) of. This strain associated with human CE showed to be the most frequent. Previous studies reported that the highest infection rates were in communities with extensive sheep farming 33,35. At least seven *E. granulosus* strains have been reported to infected human but the most common is the sheep strain36. Some of the risk factors were suggested for human CE infection including animal farming, poor hygiene, rural life and low socioeconomic status 37,38.

Conceivably, the high incidence and host preference of *E. granulosus* the sheep strain G1 genotype made it the most widely distributed strain worldwide. Many molecular epidemiologic studies based on mitochondrial gene sequences have confirmed G1 strain was the most dominant in both human and animals in different countries 18,39-45.

Phylogenetic analysis constructed from partial nucleotide sequences of *Ephla* gene grouped Iraqi local isolates with Estonian, Bulgarian, Chinese, Tunisian...

French and Spanish isolates from the GenBank as they were 99% identical. Similar high relatedness was obtained when cal gene sequences were analyzed. Thus they could be from common origin.

The on-going intensive movement of the animal and product alongside the absence or low quarantine procedures may cause the high incidence of echinococcosis and new diseases emergence in Iraq.

The results obtained, suggest that the prominent circulation of the common sheep genotype (G1) was prevalent in hyper-endemic areas of Iraq. Similar results were obtained by. They indicated that this strain is the most common one and widely spread among intermediate hosts . This study included few local isolates from Baghdad for phylogenetic analysis. A larger number of Echinococcus granulosus samples, therefore, are required to resolve the phylogenetic relatedness. Despite the limitation of adequate molecular studies, the current molecular data may be useful to plan control programs against this disease. Otherwise, networking and collaboration based efforts among environmental, human and veterinary health related Iraqi organizations are required to eliminate echinococcosis

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

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Investigation of Metronidazole Induced Liver Injury During Early Pregnancy in Rats: A Histological and Histopathological Studies

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ABSTRACT

Drug induced liver injury may result from dose-dependent direct hepatotoxicity. Metronidazole drug was an oral synthetic antiprotozoal and antibacterial agent. This drug was a recommended treatment during pregnancy for bacterial vaginosis and infections with *Trichomonas vaginalis*. The objective of this work was to assess whether treatment with commercial metronidazole during the first semester of pregnancy, in rats was associated with major hepatic abnormalities. Pregnant females rats were treated orally by curative dose of Metronidazole tablets after confirm the onset of pregnancy, liver histopathology was studied. Histopathological findings of Metronidazole drug which induced liver injury are nonspecific really but can be valuable in narrowing the differential diagnoses.

Keywords: Metronidazole; Liver injury; 1st. semester of pregnancy in rats.

INTRODUCTION

Metronidazole is an oral synthetic antiprotozoal and antibacterial agent, 1-(β-hydroxyethyl)-2-methyl-5-nitroimidazole. Each tablet, for oral administration, contains 250 mg or 500 mg of metronidazole, each tablet contains inactive ingredients: colloidal silicon dioxide, crospovidone, hydrogenated vegetable oil and microcrystalline cellulose. Disposition of metronidazole in the body is similar for both oral and intravenous dosage forms, with an average elimination half-life in healthy humans of eight hours[1].

The major route of elimination of metronidazole and its metabolites is via the urine (60 to 80% of the dose), with fecal excretion accounting for 6 to 15% of the dose. Metronidazole appears in cerebrospinal fluid, saliva, and human milk in concentrations similar to those found in plasma. Bactericidal concentrations of metronidazole have also been detected in pus from hepatic abscesses[1].

This drug is a recommended treatment during pregnancy for bacterial vaginosis (BV) and infections with *Trichomonas vaginalis* [2,3]. Preterm birth has been associated with both BV and *T. vaginalis* [4,5].

Some trials among high-risk women suggest that screening for BV and treatment with oral metronidazole may reduce preterm birth[6]. However, several trials using metronidazole in pregnant women for other reasons (e.g., asymptomatic *T. vaginalis* infection or elevated fetal fibronectin levels) have shown increased preterm birth rates[7,8]. The histological results of previous research work revealed that there was no harmful effect of the drug Metronidazole on the process of the implantation of embryo in the pregnant rat’s uterus on days 7 and 9 days post coitum [9].

There might be concerns among prenatal care providers about the theoretical potential for other adverse effects following metronidazole treatment. Metronidazole is an FDA Pregnancy Category B drug, meaning that animal studies have not revealed evidence of harm to the fetus but, adequate, well-controlled studies among pregnant women have not been conducted. It is mutagenic in bacteria [10]. And was carcinogenic drugs in rats that consumed daily dietary doses [11]. However, previous studies in humans treated with oral or intravaginal metronidazole have not shown evidence of carcinogenicity [12], or teratogenic effects[13-17].

Reactive chemical metabolites formed during hepatic drug metabolism can incite hepatocellular damage from oxidative stress and mitochondrial dysfunction causing drug induced liver injury (DILI).
DILI can result from either dose-dependent direct hepatotoxicity (e.g., acetaminophen toxicity) or from an unpredictable dose-independent idiosyncratic reaction. Genetic polymorphisms in the drug bioactivation and detoxification pathways along with host immunological factors are responsible for these rare and potentially fatal idiosyncratic DILI [18]. Of the several mechanisms proposed to elucidate the mechanism underlying immune-allergic idiosyncratic DILI, the “hapten hypothesis” is the most favored [19]. Drugs and/or their metabolites covalently bind to host proteins forming drug-protein adducts (i.e., haptens) that are processed by the antigen-presenting cells and trigger a T-cell mediated cytotoxicity or B-cell antibody response. Incidence of idiosyncratic DILI is estimated to be approximately 10–15 per 100,000 patient years [20]. About 1 in 7 cases of acute liver failure are related to an adverse drug reaction, making DILI the most common indication for liver transplantation [21]. Antimicrobials are the most common class (~45%) of drugs responsible for DILI [22]. Advanced age, female sex, drug dose, and the extent of its hepatic drug metabolism are some of the identified risk factors for DILI [23]. A “probable” reaction to metronidazole presenting as a cholestatic pattern liver injury reaction within a few days after initiation and that resolved shortly after drug cessation has been reported earlier [24].

The objective of this work was to assess whether treatment with metronidazole during early pregnancy in rats was associated with major hepatic abnormalities or not.

MATERIALS AND METHODS

Twenty adult (Rattus norvegicus) rats put in cages were used in this work. They were randomly divided into two groups, 15 of them considered as treated group, 5 as control group, it examined to insure that they were not pregnant. The rats were maintained under light program of LD 12:12 and fed ad libitum. They were mated; one male for each four females, the day on which spermatozoa were found in the vaginal smear and the presence of vaginal plug after about 16 h was designated day zero of pregnancy. All experiment implanted according to LABs low of ministry of higher education and scientific research.

Pregnant females rats were treated orally by curative dose of commercial Metronidazole tablets from local pharmacies after confirm the onset of pregnancy. The drug was from Sanofi Aventis company. Each tablet is containing 500metronidazole. The excipients for one film coated tablet: wheat starch (gluten), povidone K30, magnesium stearate, hypromellose, macrogol 20000. Each female rat was given a dose of 8 mg / 200 gm body weight daily for fourteen days. The doses were calculated according to Paget and Barnas (1964) [25]. The pregnant female rats were sacrificed to obtain liver sample for histological and histo-pathological studies. The liver samples were fixed in 10% formalin for 48 hours. The protocol of paraffin embedding was followed. Five um sections of liver tissue were mounted on glass slides to be stained with Hematoxylin and Eosin.

RESULTS

The Histopathological results have revealed:

1. There was degeneration in hepatic cells of zone I around the portal according the hepatic acinus classification of liver lobules (Figs. 1 and 2) . Some of the cells have pyknotic changes in their nuclei suggesting apoptosis in these cells. There was stagnation of the blood inside the portal vein. Moreover there was bulging of the endothelial cells toward the lumen of the arteriole in the portal triad . The bile duct has numerous projections from the lining epithelial cells.

Figure 1; (1 and 2): Hepatocytes around the portal triad, some of the cells have pyknotic their nuclei suggesting apoptotic. Stagnation of the blood inside the portal vein (PV). Bulging of the endothelial cells toward the lumen of the arteriole (HA). The bile duct (BD) has numerous projections from the lining epithelial cells. H & E stain, 200 X.

2. There was disruption of the endothelial lining of the sinusoids with the increase in the size of space of Disse (fig. 2).
Figure 2: Disruption of the endothelial lining of the sinusoids with the increase in the size of space of Disse. H and E stain, 200 X.

Congested portal vein in portal triad area. The hepatocytes in the immediate vicinity of the portal vein were lightly stained and showing pyknotic changes in their nuclei, one of them was showing fatty degeneration (2). These groups of cells are the cells of zone I according to hepatic acinus classification of liver lobules. The hepatocytes of zone II (1) were not affected (Fig. 3).

Fig. 3: The photograph is a segment of the congested portal vein in portal triad area in liver. The hepatocytes in the immediate vicinity of the portal vein are lightly stained and showing pyknotic changes in their nuclei, one of them is showing fatty degeneration (1). The hepatocytes of zone II (2) are not affected. H and E stain, 400 X.

The hepatic artery from the portal triad area showed zone I hepatocytes with degenerative changes, while that of zone II were not affected (Fig. 4).

Fig. 4: Hepatic artery from the portal triad area showing zone I hepatocytes with degenerative changes, while that of zone II are not affected. Congestion in hepatic blood vessels, disorganization of hepatic cells surrounding the central vein. H and E stain, 400 X.

Central vein congestion, sinusoidal congestion, hepatocyte necrosis. congestion of portal vein and portal triad (Fig. 5).

Fig. 5: Central vein congestion, sinusoidal congestion, hepatocyte necrosis. congestion of portal vein and portal triad. H and E stain, 400 X.

Necrosis of hepatocytes. Liver lobule showing centrilobular confluent necrosis and adjacent viable parenchyma and an apoptotic hepatocyte are present in the viable parenchyma (Fig. 6).

Fig. 6: Necrosis of hepatocytes. Liver lobule showing centrilobular confluent necrosis and adjacent viable parenchyma and an apoptotic hepatocyte are present in the viable parenchyma (H and E stain, original magnification 400X).

Necrosis of hepatocytes. Liver lobule showing centrilobular confluent necrosis and adjacent viable parenchyma and an apoptotic hepatocyte are present in the viable parenchyma, (Fig.7).

Fig. 7: Infiltrating cells in the portal tracts were predominantly lymphocytes. The liver showed severe portal and lobular hepatitis with perivenular and bridging necrosis. (H and E stain, 100X).
DISCUSSION

The widespread antibiotic usage in the practice of modern medicine has been responsible for a surge in potentially life threatening drug reactions. Antibiotics have to be used judiciously bearing in mind the risk of drug induced liver injury even for a widely used drug such as metronidazole, which is generally considered to be quite a safer drug for short-term use. Also, potentially serious adverse effects such as drug induced liver injury have to be considered in the differential diagnosis in the work up for jaundice.

In this work, histopathological findings of Metronidazole drug which induced liver injury are nonspecific really but can be valuable in narrowing the differential diagnoses and we didn’t find any teratogenic effect of metronidazole exposure during the first trimester of pregnancy on histological view, this result is same as other researchers found.

CONCLUSION

There was degeneration in hepatic cells of zone I around the portal triad. Some of the cells have expressed apoptotic changes together with stagnation of the blood inside the portal vein. Also showed bulging of the endothelial cells. The bile duct has numerous projections from the lining epithelial cells. There was disruption of the endothelial lining of the sinusoids with the increase in the size of space of Disse. There was segment of the congested portal vein in portal triad area in liver and pyknotic changes in their nuclei, and fatty degeneration. The hepatic artery from the portal triad area showed zone I hepatocytes with degenerative changes, while that of zone II were not affected. Central vein congestion, sinusoidal congestion, hepatocyte necrosis. congestion of portal vein and portal triad. Liver lobule showing centrizonal confluent necrosis and adjacent viable parenchyma and an apoptotic hepatocyte are present in the viable parenchyma.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Investigating the Role of *Toxoplasma Gondii* Infection In Diabetic Patients Type 2 Diabetes Mellitus

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**ABSTRACT**

*Toxoplasma gondii* is an obligate intracellular parasite that can cause variable clinical symptoms or can even be asymptomatic in immune-competent individuals. Both toxoplasmosis and diabetes are very common in Iraq, the present study aims to determine the possible relation between T2DM and *Toxoplasma* by detection and evaluating IgM and IgG *Toxoplasma gondii* antibody and investigating the level of C-peptide, HbA1C in diabetic patients whether infected or not infected with *Toxoplasma gondii* a case control study which was conducted on 180 patients with T2DM along with 40 healthy age and gender matched individuals who were included as healthy control. All patients were investigated for the presence of *Toxoplasma gondii* by Rapid chromatographic test and the titer was evaluated by ECLA (Electrochemiluiescence Immunoassay). All samples whether positive or negative for toxoplasma, will be subjected for measuring HbA1C by Fluorescence Immunoassay (AFIAS), C-Peptide was evaluated by (ECLIA). This study showed that 42.2% of diabetic patients were infected with *Toxoplasma gondii* and 25% of apparently control healthy were infected with *Toxoplasma gondii*, moreover 46.4 % of diabetic on insulin therapy were infected with *T. gondii* whereas 37% of diabetic on OHA were infected. Moreover IgG level was high, HbA1c was high and C-peptide was significantly low in insulin diabetic patients infected with *Toxoplasma gondii*. can be concluded that the incidence of *T. gondii* in Diabetic patients was higher than in control group thus we may predict that immune disturbance in diabetes had paved the way to Toxoplasma infection and high IgG titer may be due to the parasite itself which had direct effect on Beta cell of the pancreas causing diabetes.

**Keywords:** Toxoplasmosis, C-peptid, T2DM, ECLA

**INTRODUCTION**

Diabetes is a chronic disease which is characterized by sustained hyperglycemia and associated with interruption of carbohydrate, fat, and protein metabolism that result from abnormalities in insulin excretion, action or both. Type 2 diabetes mellitus (T2DM) is caused by deterioration in the insulin secretory capacity of pancreatic beta cells that lead to increase insulin demand. Many factors may play role in the development of type 2 diabetes such as genetic elements, autoimmune processes, infectious agents and different inflammatory biomarkers. Protozoan *Toxoplasma gondii* is an obligate intracellular parasite belongs to the phylum Apicomplexan, it has the ability to infect humans as well as all warm bloody animals, it is clear that the parasite has the ability to infect and replicate in any nucleated cells, leading to the production of different inflammatory markers via the innate and adaptive immune system. Human can be infected by this parasite by ingestion of food, water, or soil contaminated by oocytes from the definitive hosts, cats which act as intermediate and final hosts.

Toxoplasmosis is disease caused by *Toxoplasma gondii* which is consider infectious and inflammatory disease, it is most prevalent disease in humans. Many studies had proposed that infection with *T. gondii* may be consider as a likely cause of diabetes. *T. gondii* may invade and destroy pancreatic cells directly, lead to pancreatitis and more importantly, diabetes. Moreover, *T. gondii* may induce increased in the production of proinflammatory cytokines, such as TNF-α, IL-1β, and IFN-γ, which can result in insulitis. Many studies...
found that toxoplasma in DM may result in disturbing the balance between pro-inflammatory and anti-inflammatory cytokines causing damage to the pancreas [2,5].

The first antibodies appear after infection are IgM which are detectable about 1 week after the infection and may remain for several months or years. While the Toxoplasma IgG antibodies appear after 2 weeks of infection and it peaks at 3 months, and remains at a plateau level for 6 months and may remain in human serum due to the presence of dormant cyst in various anatomical sites [6].

The physiology of C-peptide makes it important for assessing Beta cell function and insulin secretion. C-peptide is a part of pro-insulin which is enzymatically cleaved prior to co-secretion of insulin from pancreatic beta cells. C-peptide is produced in equimolar amounts to endogenous insulin. Low C-peptide indicate more destruction in beta cells of pancreas [9].

HBA1C is one of the most commonly used biomarker in diabetes because its analysis in the blood provides evidence about the individual average blood glucose levels during the previous two to three months. Therefore, it’s useful to monitor the response to treatment, as well as it support the diagnosis of diabetes [10].

Electrochemiluminescence (ELCA) is a new rapid and fully automated assay for the detection of anti-Toxo-IgG and Toxo-IgM from human sera and plasma; it has a sensitivity of 100% and specificity of 99.91% [11,12]. The aim of this study is to determine the possible relation between T2DM and Toxoplasma. By detection and evaluating IgM and IgG Toxoplasma gondii antibody and investigating the level of C-peptide HbA1C in diabetic patients whether infected or not infected with Toxoplasma gondii.

**METHODOLOGY**

Case control study was conducted on 180 patients with type 2 diabetes mellitus along with 40 healthy age and gender matched individuals included as healthy control. The study was performed from 13 September 2016 to 23 November 2017. The patients were recruited from the Medical department of the Medical city /Teaching Hospital and Al-Imamian Al-Kadhimiya Medical City. All sample were collected according to ethical approval of ministry of environment and health in Iraq. All patients were investigated for the presence of Toxoplasma gondii; accordingly they were categorized into four groups, first group include patients positive for Toxoplasma gondii and on oral hypoglycemic agent (OHA), second group include patients negative for Toxoplasma gondii and on oral therapy, the third group include patients positive for toxoplasmosis and on insulin therapy and the last group include patients negative for toxoplasmosis and on insulin therapy. Five ml of whole venous blood will be taken from each patient, then blood samples were divided into two parts, Two ml of whole blood will be collected in EDTA tube for estimating HbA1c level by Immune assay within 48 hours. Three ml of blood was used to collect serum for rapid chromatographic screening test to detect Toxoplasma gondii, for evaluating IgG and IgM titer by ECLA, and for assessing C-peptide by ECLA. The serum will be stored at -20°C until used.

**Rapid chromatographic test**

Rapid chromatographic kit was used (CTK Biotech Inc) is 3 line -lateral flow assay for detection and differentiation IgM, IgG antibody in serum, plasma or whole blood.

**ECLIA for estimation titer of toxoplasma antibody**

Antibody level IgG, IgM will be evaluating in diabetic patient on (OHA, insulin therapy) by ECLA (Catalog number 04618815 Roche, Germany). It is quantitative technique based on two specific antigen for Toxoplasma gondii, first antigen is Biotinylated Toxoplasma gondii specific antigen and second T gondii-specific antigen labeled with ruthenium complex. Those antigens bound to antibodies in the serum. Then this immune complex react with streptavidin-coated micro particle via the biotinylated antigen. The software determines results automatically. Control healthy subjects will be investigated for Toxoplasma infection by rapid chromatographic test and ECLA technique. The results obtained with ECL assay was interpreted as follows:

- non reactive <0.7, intermediate ≥0.7 <1, reactive ≥1.

**ECLA immunoassay for measuring C-peptide**

(Catalog number:03184897) Roche Germany
All samples whether positive or negative for toxoplasma, will be subjected for measuring C-peptide by ECL technique reference range of C-peptide: 1.1-4.4 ng/mL

**Measurement of HbA1C** Catalog number: INS AA. EN by Automatic Fluorescence Immunoassay (AFIAS) is fluorescence immunoassay (FIA) for the quantitative determination of HbA1C (Hemoglobin A1C) in human whole blood. The test used a sandwich immunodetection method; the detector antibody in buffer binds to antigen in sample, forming antigen-antibody complexes and migrate onto nitrocellulose matrix to be captured by the other immobilized antibody on test strip.

The result calculate automatically and display HbA1C concentration of the test sample in term of percentage %. The reference value which based on the National Glycohemoglobin standardization program (NGSP) (%) = 4.5-6.5%

**RESULT**

**Demographic characteristic of diabetic patients and control** Result of current study showed that mean age of diabetic patients was 58.88 ±11.07 years whereas, that of control subjects was 57.95 ±6.8; the difference was not significant (P=0.897). Mean duration of disease in patients with type 2 diabetes, was 8.13 ±4.73 years and it ranged from 1-30 years. Male to female ratio of patient group was 1:1.02, whereas that of control group was 1:1.86; there was no significant difference in gender distribution between control and patient groups (P=0.098).

The association between diabetes mellitus and toxoplasmosis were assess using rapid test. Result showed that the rate of toxoplasmosis, was higher in diabetic patients than that of control subjects, 42.2% versus 25% respectively, the statistical analysis show significant differences between diabetic patients and control subjects P-value (P = 0.043). Moreover, Odds ratio was 2.29 with a 95% confidence interval of 1.01-4.76 indicating an approximately twofold risk of having toxoplasmosis in diabetic patients in comparison with control subjects. As shown in table 1

<table>
<thead>
<tr>
<th>Toxoplasma</th>
<th>Diabetes n = 180</th>
<th>Control n = 40</th>
<th>P†</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>76 (42.2)</td>
<td>10 (25)</td>
<td>0.043 S</td>
<td>2.19</td>
<td>1.01-4.76</td>
</tr>
<tr>
<td>Negative</td>
<td>104 (57.8)</td>
<td>30 (75)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n: number of cases; †: Chi-Square test; S: significant at P ≤ 0.05; CI: confidence interval

Moreover 46.4% of diabetic on insulin therapy were infected with T.gondii whereas 37% of diabetic on OHA were infected. Immunoglobulin (IgG) level was significantly highest in patients on insulin therapy who were positive for toxoplasmosis (a median of 25 IU/ml) in comparison to those on OHA who were positive for toxoplasmosis (a median of 10.9 IU/ml) (P<0.05), as shown in table 2

The Mean HbA1c % was significantly highest in diabetic group patients on insulin therapy who were positive for toxoplasmosis (10.70 ±0.75 %) followed by diabetic group on insulin therapy who were negative for toxoplasmosis (8.79 ±1.14% %) and then by diabetic patients on Oral Hypoglycemic Agent (OHA) whether positive or negative for toxoplasmosis (7.50 ±0.93 % and 7.60 ±1.17 %) respectively (P<0.05). The level of C-peptide was significantly lowest in patients on insulin and positive for toxoplasma (median of 0.7ng/ml), immediately preceded by patients on insulin and negative for toxoplasma (a median of 1.95 ng/ml). The level in patients on OHA and toxoplasma positive was (a median of 1.95 ng/ml) and that of patients on OHA and toxoplasma negative (a median of 2.44 ng/ml), as shown in table 2.
Table 2: Diabetic serum parameters and IgG Immunoglobulin

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>OHA Toxoplasma Positive n = 30</th>
<th>OHA Toxoplasma Negative n = 51</th>
<th>Insulin Toxoplasma Positive n = 46</th>
<th>Insulin Toxoplasma Negative n = 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1C Mean ±SD (%)*</td>
<td>7.50 ±0.93 C</td>
<td>7.60 ±1.17 C</td>
<td>10.70 ±0.75 A</td>
<td>8.79 ±1.14 B</td>
</tr>
<tr>
<td>C-peptide; median (IQR) (ng/ml)†</td>
<td>1.95 (1.3) A</td>
<td>2.44 (1) A</td>
<td>0.7 (0.66) C</td>
<td>1.8 (1.01) B</td>
</tr>
<tr>
<td>IgG titer median (IQR) (IUg/ml)†</td>
<td>10.9 (8.32) B</td>
<td>&lt; 1</td>
<td>25 (8) A</td>
<td>&lt; 1</td>
</tr>
</tbody>
</table>

OHA: oral hypoglycemic agent; n: number of cases; SD: standard deviation; IQR: inter-quartile range †: one way ANOVA with post hoc LSD test; †: Kruskal Wallis with Mann Whitney U test; Capital letters to indicate significant level; similar letter indicate insignificant difference at $P \leq 0.05$ whereas, different letters indicate significant difference at $P \leq 0.05$.

All samples were negative for IgM antibody for Toxoplasma gondii by rapid chromatographic test and ECLIA technique toxo IgM <0.8 COI

DISCUSSION

In the present study the mean age of DM patients was 58.88 ±11.07 years which was expected since those patients were type 2 DM that is common in older age. Regarding gender ratio for Type 2 DM patients that was 1:1.02, and that of control group was 1:1.86 . Although there was no significant difference in gender distribution among control and patient groups ($P=0.098$) but the incidence of infected female with toxoplasmosis was higher than infected male similar to many studies [13,14,15], this may be due to many factors such that women involved heavily in the house work, especially dealing with meats, preparing salads, cooking, cleaning and consequently will be exposed more to the risk factors of toxoplasmosis and other diseases[14].

This study showed that the duration of the disease was significantly longer in insulin diabetic patients compared to those on oral hypoglycemic group and this was expected since the former group consider as complicated cases of the latter group.

In the present study, there were high incidence of toxoplasma infection in diabetic patients; 42.2 % versus 25% in control group, (P-value = 0.043). Moreover the odds ratio was 2 with a 95% confidence interval of 0.92-4.34 indicating a twofold risk of having toxoplasmosis in diabetic patients in comparison with control subjects.

In the current study the incidence of Toxoplasmosis
among diabetic patients was lower than that reported by Molan et al study in Diyala province which stated that among 450 diabetic patients, 300 presented with toxoplasma infection (66.6%) and those patients were sero-positive for IgG, while only 68 out of 203 non diabetic control patients had toxoplasmosis (33.4%) \[14\]. This discrepancy in the results may be due to the high sensitivity and specify of the ECL technique used in this study compared to other technique that had high false positive results \[11,12\].

Majidian et al found by meta analysis among seven publications that the Odds Ratio\(\text{OR}\) in type 2DM was 2.39 with confidence Interval \(\text{CI}\) of \(95\%\, \text{CI}=1.20-4.75\) and the \(P\) value was 0.013, and he concluded that chronic toxoplasmosis is a possible risk factor for type 2DM\[3\].

To the best of my knowledge this study is the first study on the incidence of Toxoplasmosis among subgroup of type 2 DM which showed that it was higher in Insulin therapy patients compare to those who were on oral hypoglycemic agent (OHA). This high incidence of toxoplasmosis among Iraqi population due to that toxoplasmosis is well known an endemic disease, that may due many reasons such as the geographical variation, customs, habits, difference in genetic susceptibility and the acquisition method of Toxoplasma infection\[16,17\].

The high incidence in DM especially in insulin patients may due to that chronic diabetes patients suffer from lower immune response which may pave way to toxoplasmosis \[14\].

In the present study no \(T.gondii\) IgM antibodies were detect in any of the infected DM subgroups or in control group, and this was consistence with study done by Molan et al who did not detect IgM in diabetic patients and in apparently healthy control group who were infected with \(T.gondii\) \[14\].

On the other hand Sharad and Al-Hamairy had reported that 11.4% of the diabetic patients living in Babylon Province, Iraq, were found to be seropositive for IgM \(T.gondii\) antibodies \[20\].

Gangneux F R et al had stated that the detection of IgM may be due to a pitfall in serologic interpretations concerns IgM detection and that its specificity must be confirmed by a second technique \[21\].

Furthermore patients on insulin therapy showed higher IgG level compared to patients on OHA and control group and patients on OHA had higher titer than control group. This may be due to that the high IgG toxoplasma antibodies in diabetic patients and specifically in patients on insulin therapy may reflect either reactivation of infection, or persistent immune response to a dormant infection \[22,23\]. This concept was further confirm by M. Gláucia et al study which found that in areas with high prevalence of toxoplasmosis, reinfection or reactivation of the infection might cause an intense immune response that was manifested by an elevation of IgG level \[24\].

HbA1c The most commonly used neo-epitope biomarker in the field of diabetes and, it is useful for monitoring response to treatment, as well as supporting the diagnosis of diabetes\[18\].

HbA1C was significantly highest in patients on insulin therapy whether positive or negative for toxoplasma in comparison with those on oral hypoglycemic drugs whether positive or negative for toxoplasma. This was expected because patients on insulin had uncontrolled blood sugar due to long duration of diabetes, and disturbance of pancreatic function as manifested as an increase in the rate of beta-cells destruction \[19\], this was aggravated by infection of toxoplasmosis. This result was similarly found by Modrek et al study which showed that there was a close relation between HbA1C and toxoplasma infection as expressed by level of Toxoplasma IgG and IgM antibodies in diabetic patients \[13\].

C-peptide is the most useful and simple insulin secretion parameters for predicting future OHA failure in type 2 diabetic subjects. Moreover C-peptide may help to identify insulin-treated patients with sufficient beta-cell function who can safely replace insulin with other hypoglycemia therapies\[25,26\].

To the best of our knowledge this is the first study on C-peptide in diabetic patients with toxoplasmosis. This study revealed that the level of C-peptide was significantly lowest in patients on insulin Toxo +, immediately followed by insulin Toxo -, both groups had lower level of C-peptide than patients on OHA. The low C-peptide in diabetes was explain by many studies \[27,25,28,29\] who had found that pancreatic B cell dysfunction, manifested as low C-peptide in type
2 diabetes, will decline continuously over time, this will play an important role in OHA drug failure and the change from OHA to insulin therapy dependency. The pancreatic B cell dysfunction in type 2 diabetes will be further deteriorated by infection with *Toxoplasma gondii* which may infect directly the beta cells and this will lead to gradually destruction of these cells[4,5,30]. Moreover, there was highly significant negative correlation between c-peptide and serum IgG level in diabetic patients, indicating that high level of IgG is associated with low C-peptide level and this relation was more obvious in patients on insulin therapy rather than those on OHA. This due to that those patients had more severe and chronic disease as manifested by the lower c-peptide and disturbance of the immune response that render the patients more vulnerable to severe infection or reactivation of chronic infection that may resulted in higher IgG level [2,3]

**In conclusion**

This study showed that the incidence of *T. gondii* in Diabetic patients was higher than in control group that may be explained by predict that immune disturbance in diabetes had paved the way to Toxoplasma infection and even result in higher IgG level may be due to the parasite itself which had direct effect on Beta cells of the pancreas causing diabetes. this debate should be further studied. Moreover, this study showed that toxoplasma positive DM type 2 patients on insulin therapy had much higher IgG titer, lower C-peptide level and higher HbA1C compared to those on OHA that may explain by pancreatic B cells dysfunction in type 2 diabetes will be further deteriorated by infection with *Toxoplasma gondii* which may infect directly the beta cells render the patients Insulin dependent.

**Conflict of Interest:** There is no conflict of interest.

**Funding:** Self-funding for implemented study.

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Study the Distribution of Oral *Trichomonas Tenax* at Almukadissa City /IRAQ

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¹College of Dentist / Kerbala University/Iraq, ²College of Veterinary Medicine / Kerbala University/Iraq

**ABSTRACT**

The aim of this study is to investigate the percentage rates of distribution of oral *Trichomonas tenax* in patients at Kerbala city during period from October 2016 until October 2017. This study conducted using 199 samples that taking from 160 patients randomly selected at the University of Kerbela /College of Dentist that included 80 females and 80 males at age of [15 – 62 years old] to detect the rates of distribution of parasite according to sex, age, and oral hygiene degree.

The results of this study showed that Oral *Trichomonas tenax* was found in [25%] out of examined patients, and the infection with *Trichomonas tenax* was more frequently obtained in females than in males but without presence of statistical differences. The infection was found in patients below the age of 30 years and in those older than 50 years was almost identical [12.90% and 25.49% respectively] with no presence of any statistical differences. Also the infection was less than in those that appear healthier oral cavity.

Molecular study was used to determine of *Trichomonas tenax* using PCR technical polymerase to select the series of genetic material. A common injury with *Trichomonas tenax* [AG_070125 surface antigen BspA-like] as20.1%

**Keywords:** *Trichomonas tenax*, oral, Kerbala city.

**INTRODUCTION**

The oral cavity of human is colonized by specific microorganisms as bacteria, fungi, and protozoa. Among of these, *Trichomonas tenax* [*T. tenax*] that known as common anaerobic parasite of oral cavity that also found in sub maxillary glands [¹].

This parasite is commonly found in oral cavity and patients with poor oral hygiene and periodontal disease involved. The occurrence of *T. tenax* is depending on host age. Different factors are responsible for transmission of parasite that includes incidence by saliva through kissing, or application of polluted dishes and drinking water [*², ³*]. Depending on oral health status, level of contamination is reported between 0 to 25% [*²*]

Several studies were undertaken in relation to prevalence of periodontal disease in syndrome down [DS] patients [*⁴ -⁷*]. In this case or syndrome will lead to influence the defective neutrophil chemo taxis on the progression of periodontal disease [*⁴*]. Also, the studies display that the level of prostaglandin E2 [PGEI] detected in gingival crevicular fluid [GCF] from DS patients is increased, a fact that may be of importance in the pathogenesis of the periodontal disease frequently seen in these patients [*⁹*]. Moreover, pulmonary trichomoniasis is usually caused by aspirated *T. tenax* [*², ¹⁰*]. Afterwards, health of DS patients could be affected because of this infections and intrinsic defect of the immune system in DS [*¹¹*].

As correlation to this parasite and periodontal diseases in DS patients, pulmonary trichomoniasis and due to public health importance, this study was performed to determine the prevalence of *T. tenax* in oral cavity of DS patients with periodontal disease and in healthy population in Kerbala , Iraq.

**MATERIALS AND METHOD**

One hundred and ninety nine samples were taken from 160 patients randomly selected at the University of Kerbela /College of Dentist for period from October
2016 until October 2017. Eighty females aged (15 – 62) years and same numbers of males were included in this study according to, Age, Sex and Oral hygiene degree:-

Up to 1/3 of tooth surfaces cover with dental plaque.
Up to 2/3 of tooth surfaces cover with dental plaque.
More than 2/3 of tooth surfaces cover with dental plaque.

None of all patients were under antibiotic or chemical therapy. 63 samples were taken from saliva, 51 samples taken from dental plaque in clean tooth area, 44 samples taken from dental plaque- unclean area, 15 samples taken from carious dentine and 26 samples taken from carious dentine and 26 samples taken from tooth canal contents of the teeth with necrotic pulp where endodontic space were opened by caries. All sample were collected according to ethical approval of ministry of environment and health in Iraq.

All samples were cultured in liquid Diamond axenic broth medium [20-23], heated in a thermostat to 37 c (98.6F) and the results read after 24, 48, 72, 96, and 120 hours by using light microscope and native smears with magnification of 100 and 400 [12]. The results were considered positive if living Trichomonas observed in the smear.

The fresh clinical isolates of T. tenax were grown, for up to three weeks, using batch culture at 37°C in trypticase-yeast extract-maltose [TYM] medium supplemented with 10% heat-inactivated horse serum. Then DNA extraction with kit promega company was employed. The T. tenax [ AG_070125 surface antigen BspA-like] isolate was confirmed using the sense primer [5'- TGATCAATCTTAAAATAGT -3'] and antisense primer [5'- TTATGTTTGAGTGAGAAGAT -3'] with 1712bP [13].

Statistical analysis was carried out by chi-square test with a continuity factor [14].

RESULTS

In this study a 160 patients were examined. Oral Trichomonas tenax was found in 40 [25%] out of 160 examined patients [ Table-1 ]. The group of 160 patients had 80 females and 80 males, Trichomonas infection was found in 23 females [28-75% ] and in 17 males [21-25%] as in [Table-1]. Trichomonas tenax was more frequently obtained in females than in males ,but the differences was not statically significant. Trichomonas tenax finding in the patients below the age of 30 years and in those older than 50 years was almost identical ( 12.90% & 25.49% respectively ) Table-2. In the patients age 30-50 years, oral Trichomonas was found in 19 [40.42%], out of 47 patients examined nether this difference was significant. Trichomonas tenax was not found in the saliva of any of the 63 patients examined ( Table-3 ) in 51 samples with of dental plaque from physiologically clean tooth areas , oral Trichomonas tenax was observed in 9 samples ( 17.64%).in 44 samples tooth areas, oral Trichomonas tenax found in 28 samples ( 63.63%). Trichomonas tenax was not found in any of the 15 samples of carious dentine, but it was found in 3 (11.53%) out of 26 samples of root canal contents. With respected to the oral hygiene degree, oral Trichomonas tenax was most frequently observed 17 out of 42 patients (40.17%). In patients with poor oral hygiene degree 3, but the difference was with did not statistical significant ( Table-4 ).

Table -1- Oral distribution of Trichomonas tenax according to sex.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No.of examined Patients</th>
<th>Positive cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Females</td>
<td>80</td>
<td>23</td>
</tr>
<tr>
<td>Males</td>
<td>80</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>40</td>
</tr>
</tbody>
</table>

Table -2- Oral distribution of Trichomonas tenax according to age.

<table>
<thead>
<tr>
<th>Age [ years ]</th>
<th>No.of examined Patients</th>
<th>Positive cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Less than 30</td>
<td>62</td>
<td>8</td>
</tr>
<tr>
<td>30-50</td>
<td>47</td>
<td>19</td>
</tr>
<tr>
<td>Moe than 50</td>
<td>51</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>40</td>
</tr>
</tbody>
</table>
Table -3- Sites of oral distribution of *Trichomonas tenax*.

<table>
<thead>
<tr>
<th>Site of sampling</th>
<th>No. of examined Samples</th>
<th>Positive cases</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Saliva</td>
<td>63</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Dental plaque [clean area]</td>
<td>51</td>
<td>9</td>
<td>17.64</td>
</tr>
<tr>
<td>Dental plaque [unclean area]</td>
<td>44</td>
<td>28</td>
<td>63.63</td>
</tr>
<tr>
<td>Carious dentine</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Root canal</td>
<td>26</td>
<td>3</td>
<td>11.53</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>40</td>
<td>20.1</td>
</tr>
</tbody>
</table>

Table -4- Oral distribution of *Trichomonas tenax* according to the oral hygiene.

<table>
<thead>
<tr>
<th>Oral hygiene degree</th>
<th>No. of examined Patients</th>
<th>Positive cases</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Up to 1/3 of tooth surfaces cover with dental plaque.</td>
<td>43</td>
<td>05</td>
<td>11.62</td>
</tr>
<tr>
<td>Up to 2/3 of tooth surfaces cover with dental plaque.</td>
<td>75</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>More than 2/3 of tooth surfaces cover with dental plaque.</td>
<td>42</td>
<td>17</td>
<td>40.47</td>
</tr>
<tr>
<td>total</td>
<td>160</td>
<td>40</td>
<td>25</td>
</tr>
</tbody>
</table>

Trichomonas tenax [AG 070125 surface antigen BspA-like] It appeared that the stability of the package of the gene at the site 1712 base pair.

**DISCUSSION**

Oral Trichomonas, an anaerobic flagellate protozoan, is more frequently found in elderly people, in those suffering from periodontal diseases. In this study, 160 patients were examined. Oral *Trichomonas tenax* was found in 40 [25%] out of 160 examined patients. The group of 160 patients had 80 females and 80 males, Trichomonas infection was found in 23 females [28-75%] and in 17 males [21-25%]. Higher incidence were reported from other parts of the world such as Rumania [20-48%], United States of America [16 to over 30%], Italy [40%], Iraq [6-14%]8, Hungary [38.3%] and Malaysia [32%] it is generally stated that the incidence rates increase with the age; however, our results can be attributed to the better degree of oral hygiene, tooth brushing and proper restorations of decayed teeth and periodontal problems in our patients. *Trichomonas tenax* is capable of invading the unusual oral sites when conditions in these sites become favorable for its survival and multiplication.

Dental plaque seems to be an oral structure where oral Trichomonas finds the best environment for its growth and survival in the physiologic conditions of the human mouth. Dental plaque is a very dynamic ecosystem passing through several phases in its development, starting with the initial adherence phase where microorganisms pioneers adhere to the tooth surface [in this phase, oxygen may get into the plaque - aerobic conditions]. Then, the intermediary phase follows, where an intensive Struggle among microorganisms for predominance in the life environment takes place [oxygen may still get into the plaque], until a relative plaque metabolism stability in a microbe community is reached [the final phase when oxygen is not available, anaerobic conditions].
The parasite Trichomonas tenax [AG_070125 surface antigen BspA-like] It appeared that the stability of the package of the gene at the site 1712 base pair in addition that, This expansion, in conjunction with the shaping of metabolic pathways that likely transpired through lateral gene transfer from bacteria, and amplification of specific gene families implicated in pathogenesis and phagocytosis of host proteins may exemplify adaptations of the parasite during its transition to a urogenital environment[18].

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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The present study was designed to evaluate the role of total alkaline phosphatase and placental alkaline phosphatase, in addition to another liver function tests in predicting abortion at second trimester of pregnancy. One hundred samples of blood were taken from pregnant women, the samples diagnosis done by ELISA system for demonstration about IgG, IgM antibody for abortion causes like Toxoplasmosis, CMV, Rubella, APL, ACL, in addition to measuring of total alkaline phosphatase and placental alkaline phosphatase as well as liver functions tests including (serum total protein, serum albumin, total serum bilirubine, direct and indirect bilirubine, gamma glutamyl transferase, glutamic oxalo acetic transaminase, glutamic pyruvic transaminase) according to kits manufactures. The results showed that there is a significant difference according to age group between the threatened abortion women as compared to normal pregnant women at second trimester. Statistical analysis showed significant increase in total, direct and indirect bilirubin concentration levels in threatened abortion women in second trimester as compared with normal pregnant women. Serum total protein concentration levels were showed no significant differences between normal pregnant and threatened abortion women during second trimester, while Serum concentration of albumin level was showed highly significant increase in threatened abortion women, as well as, GGT concentration also showed significantly increased level in threatened abortion women at second trimester when compared with normal pregnant women. Serum concentration level of ALT, AST, ALT/AST ratio were showed no significant differences between normal pregnant and threatened abortion during second trimester. Statistical analysis of TALP, PALP, PALP/TALP ratio were showed highly significant decrease mean serum level in threatened abortion women as compared with normal pregnant women at the same trimester.

Can be concluded that total alkaline phosphatase and Placental alkaline phosphatase concentration levels in case of threatened abortion women at second trimester in addition to their highly specificity and sensitivity may help the gynecologist in predicting abortion especially when these enzymes were estimated at the middle of second trimester (20 weeks of gestation), in addition to another liver function tests.

**Keywords:** placental alkaline phosphatase, abortion, liver function test
placenta, bone, kidney and intestine. It is increased in serum of pregnant women, specifically in second and third trimesters. Total alkaline phosphatase (TALP) starts to rise at fourth month of gestation period reaching a peak at third trimester, this elevation due to placental alkaline phosphatase entering the blood of pregnant women, since human trophoblastic cell is rich in alkaline phosphatase, measuring of serum placental alkaline phosphatase origin is therefore has particular attentions in investigations of placental insufficiency, placenta is fetal organ sits between fetus and mother connecting the fetus with maternal blood supply, continuous increasing the expression of placental alkaline phosphatase during pregnancy suggests that this enzyme may has a role in feto-maternal metabolism as well as in placental differentiation, while low activity of total alkaline phosphatase in the first trimester may be indicated affected fetus. a large body of epidemiological evidence demonstrated that adverse influence during early developmental particularly in utero will increase risks of developing diseases in all adult life. This concept is known fetal programming or name as development origins of health and diseases have profound effect in public health strategies to preventing of many diseases.

There are many causes for abortion like autoimmune condition associated with anticardiolipin (ACL) and antiphospholipid (APL) antibodies sometimes produce vascular abnormalities in placenta and decidua, successful pregnancy can be achieved by the treatment with corticosteroid and low-dose aspirin. Infectious reasons like Rubella virus and Cytomegalovirus (CMV) both viruses cause abortions and can be transmitted to fetus through placenta causing serious congenital defect. another reasons of abortion in pregnant women infected by Toxoplasma gondii which vertical transmission to fetus leading to congenital toxoplasmosis causing ocular and severe neurological disease as well as cerebral and cardiac anomalies. The study aims To evaluate the effect of placental alkaline phosphatase, total alkaline phosphatase, in addition to determine the changes in another liver function tests in women threatened with abortion at second trimester, as well as diagnosis the pathological causes of abortion in these women.

MATERIALS AND METHODS

One hundred samples of blood were taken from pregnant women at second trimester who attending at Al-Zahraa Teaching hospital during the period from October 2017 to march 2018. all sample were collected according to ethical approval of ministry of environment and health in Iraq. The samples diagnosis done by ELISA system for demonstration about IgG, IgM antibody for abortion causes like Toxoplasmosis, CMV, Rubella, APL, ACL. Toxoplasmosis (Kits for IgG and IgM as foresight company). CMV (Kits for IgG and IgM as human company), Rubella (Kits for IgG and IgM as biomerieux company). APL, ACL ( Kits for IgG and IgM as generic assay company). Values of antibodies depended to consider the results as positive or negative.

Laboratory investigations for liver function tests:

Measuring of total alkaline phosphatase and placental alkaline phosphatase in addition to liver functions tests including (serum total protein, serum albumin, total serum bilirubine, direct and indirect bilirubine, gamma glutamyl transferase, glutamic oxalo acetic transaminase, glutamic pyruvic transaminase) according to kits manufactures:

Measuring of placental alkaline phosphatase from heating the rest of sample in water bath in 56°C and then pass the sample in mendery apparatus to calculate the proportion of PALP according to the procedure recorded by Bishop et. al., (2010). Who reported that placental alkaline phosphatase is known as the heat stable enzyme, because it is heat resistant at 60°C, this property is very important to distinguish placental enzyme from other enzymes.

Statistical Analysis

The values of these parameters were presented as mean ± standard deviation (S.D.), and significant differences between means were assessed by ANOVA test, by using the computer programme social package for statistical analysis (SPSS) version 7.5 in which a probability (P) equals or less than 0.05 were considered significant.

RESULTS

The total patients showed that there is significant differences according to age group between the threatened abortion women as compared to normal pregnant women at second trimester (table 1).
Table (1): Age distribution of normal pregnant and threatened with abortion women at second trimester

<table>
<thead>
<tr>
<th>Age group</th>
<th>Normal pregnant</th>
<th>Threatened abortion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F %</td>
<td>F %</td>
<td></td>
</tr>
<tr>
<td>16-25</td>
<td>21 42.0</td>
<td>12 24.0</td>
<td>0.05</td>
</tr>
<tr>
<td>26-35</td>
<td>23 46.0</td>
<td>15 30.0</td>
<td></td>
</tr>
<tr>
<td>36-45</td>
<td>6 12.0</td>
<td>23 46.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 100.0</td>
<td>50 100.0</td>
<td></td>
</tr>
</tbody>
</table>

CMV show great percentage of abortion (46%), followed by Rubella virus infection with percentage (32%) then by Toxoplasma gondii (20%) (table 2).

Table (2): Number and percentage of aborted pregnant women at second trimester with their pathological causes.

<table>
<thead>
<tr>
<th>Number of aborted women at second trimester</th>
<th>Percentage (%)</th>
<th>Abortion causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>46</td>
<td>CMV</td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>RUB</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>Toxoplasma gondii</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>ACL</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>APL</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
<td>Total</td>
</tr>
</tbody>
</table>

Statistical analysis showed significant increase in total, direct and indirect bilirubin concentration levels in threatened abortion women in second trimester as compared with normal pregnant women (table 3).

Table (3): Statistical analysis of total serum bilirubin, direct, indirect bilirubin in second trimester for normal pregnant and threatened abortion women

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal pregnant Second trimester Mean ± S.D</th>
<th>Threatened abortion Second trimester Mean ± S.D</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total serum bilirubin mg/dl (TSB)</td>
<td>9.12 ± .859</td>
<td>14.93 ± 1.628</td>
<td>0.04</td>
</tr>
<tr>
<td>Direct bilirubin mg/dl</td>
<td>3.52± 0.221</td>
<td>5.96 ± 0.650</td>
<td>0.05</td>
</tr>
<tr>
<td>Indirect bilirubin mg/dl</td>
<td>2.70 ± 0.104</td>
<td>4.98 ± 0.470</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Serum total protein concentration levels were showed no significant differences between normal pregnant and threatened abortion women during second trimester, while Serum concentration was showed highly significant increase albumin level in threatened abortion women, as well as, GGT concentration also showed significantly increased level in threatened abortion women at second trimester when compared with normal pregnant women (table 4).
Table (4): statistical analysis of serum total protein, serum albumin and GGT of normal pregnant and threatened with abortion women at second trimester

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal pregnant Second trimester Mean ± S.D</th>
<th>Threatened abortion Second trimester Mean ± S.D</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum total protein g/dl</td>
<td>5.49 ± 0.293</td>
<td>6.21 ± 0.315</td>
<td>0.06</td>
</tr>
<tr>
<td>Serum albumin g/dl</td>
<td>2.22 ± 0.101</td>
<td>7.94 ± 0.488</td>
<td>0.01</td>
</tr>
<tr>
<td>GGT</td>
<td>15.00 ± 1.148</td>
<td>39.56 ± 2.930</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Serum concentration level of ALT, AST, ALT/AST ratio were showed no significant differences between normal pregnant and threatened abortion during second trimester (table 5).

Table (5): statistical analysis of ALT, AST, ALT/AST ratio of normal pregnant and threatened with abortion women at second trimester

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal pregnant Second trimester Mean ± S.D</th>
<th>Threatened abortion Second trimester Mean ± S.D</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT U/L</td>
<td>25.14 ± 2.895</td>
<td>23.05 ± 1.797</td>
<td>0.06</td>
</tr>
<tr>
<td>AST U/L</td>
<td>21.85 ± 3.041</td>
<td>20.54 ± 1.355</td>
<td>0.07</td>
</tr>
<tr>
<td>ALT/AST ratio</td>
<td>1.27 ± 0.240</td>
<td>1.08 ± 0.072</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Statistical analysis of TALP, PALP, PALP/TALP ratio were showed highly significant decrease mean serum level in threatened abortion women at second trimester as compared with normal pregnant women at the same trimester (table 6).

Table (6): statistical analysis of TALP, PALP, PALP/TALP ratio in second trimester for normal pregnant and threatened abortion women

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Normal pregnant Second trimester Mean ± S.D</th>
<th>Threatened abortion Second trimester Mean ± S.D</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TALP</td>
<td>130.70 ± 8.255</td>
<td>70.12 ± 4.549</td>
<td>0.01</td>
</tr>
<tr>
<td>PALP</td>
<td>28.28 ± 3.754</td>
<td>5.34 ± 1.022</td>
<td>0.01</td>
</tr>
<tr>
<td>PALP/TALP ratio</td>
<td>0.22 ± 0.047</td>
<td>0.08 ± 0.020</td>
<td>0.01</td>
</tr>
</tbody>
</table>
DISCUSSION

This study is the first type of investigation about liver function tests in normal pregnant and threatened abortion women at second trimester in Iraq, the research is design to compare between the level of placental and total alkaline phosphatase concentrations in normal pregnant women and women threatened with abortion at second trimester, in addition to another serum liver function tests, importance of this research is due to early diagnosis of liver disease if present during pregnancy and it is necessary in the management of liver function during pregnancy and to used it as prognostic tests for abortion, normal physiological changes during pregnancy could be altered the normal range of liver function tests. Total, direct and indirect bilirubin serum concentrations in our study were decreased in second trimester of normal pregnant women but still within normal values, hemodilution may be at least partly responsible for decreasing in bilirubin, because albumin is the protein transport bilirubin, this results supported by the results of Hummiede et. al., (2017) who reported that serum total, direct, and indirect bilirubin concentration was slightly decreased in second trimester of normal pregnant women, while total, direct, and indirect bilirubin concentration was significantly higher in threatened abortion women in second trimester when compared with normal pregnant women at same trimester. Serum total protein concentration level shows no significant change in normal pregnant women and women threatened with abortion, serum albumin concentration was decreased in normal pregnant, this result is in agreement with the result of Gohel et al. (2013), who reported that albumin concentration was reduced during pregnancy. As well as albumin level shows highly significant increase in threatened women with abortion at second trimester, also the present study shows normally decrease of Gamma Glutamyl Transpeptidase (GGT) concentration level during pregnancy, while it is showed significant increase in women threatened with abortion as compared with normal pregnant women, decreasing in GGT activity during pregnancy can explained through the inhibition of hepatic synthesis to GGT by hormones secretion in gestation. Regarding to another liver enzymes like GPT and GOT, both of them showed no significant difference in normal pregnant women and in women threatened with abortion at second trimester, this result is disagreement with result of Larsson et. al., (2008), who reported that there is an elevation level in serum alanine transaminase (ALT) during pregnancy but highly increasing activity values above the normal limit in pregnancy should be considered pathologic and must be lead to other investigations, also our results disagreement with the results of Pradumna et. al., (2009), who reported that the results of serum AST and ALT tests for pregnant women have lower values as compared to normal reference range.

Alkaline phosphatase is increasing gradually during pregnancy reaching a peak at third trimester nearly twice its pre-gestational value, majority of increasing due to placental alkaline phosphatase isoenzyme. Several researches have indicated that ALP is involving in cellular events like the regulation of cell growth, protein phosphorylation, cellular migration and apoptosis during embryonic development. We report here that the placental alkaline phosphatase is found in the normal pregnant women circulation and increases during gestation, in abnormal pregnancy or pregnant threatened with abortion placental alkaline phosphatase do not increased proportionally, hence serum total alkaline phosphatase, placental alkaline phosphatase levels and PALP/TALP ratio were significantly higher in the second trimester of normal pregnant women compared with threatened abortion women at same trimester, these results are in agreement with results of sulaiman (2016), who reported that there is similar increasing of PALT and TALP in normal pregnant as compared with aborted women at second trimester.

The prevalence of rubella virus infection was higher among women at 2nd trimester, this agrees with results of Olajide et al., (2015) and Agbede et al., (2011), who reported that the highest prevalence of rubella virus infection in pregnant women at second trimester, our results show that the most important microbial agents causing abortion in second trimester of pregnancy are CMV (46%), then rubella (32%), followed by toxoplasma gondii (20%), these results are in agreement with results of Hammadi et. al., (2017), who reported that CMV and rubella virus are the most prevalence agents causing abortion.

CONCLUSION

Total alkaline phosphatase and Placental alkaline phosphatase concentration levels in case of threatened abortion women at 2nd trimester in addition to their highly
specificity and sensitivity may help the gynecologist in predicting abortion especially when these enzymes were estimated at the middle of 2nd trimester (20 weeks of gestation), in addition to another liver function tests. Still, this decrease is not clarify enough, so a genetic study for total ALP and its placental isoenzyme (PALP) during second trimester may help in protect women from abortion. There is a relation between causes of abortion and the period of abortion during pregnancy.

Ethical Clearance: The Research Ethical Committee at scientific research by ministry of higher education and scientific research

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REFERENCES


Euthanasia: India`s Major Religious Points of Views

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ABSTRACT

The term euthanasia has taken world-wide discussion which assumes various dimensions of acceptance and rejection. The modern advance medical technology raises moral issues of sustaining life and withdrawing life support or taking life which brought attention of religious thinkers or philosophers. The purpose of this article is to describe India`s major religious standing on end of life decisions. That is to consider Hindu`s, Christians and Islamic religious views on euthanasia and how these religions addresses the issue. The review on religious views on euthanasia is based on literature research. The study observes that Muslims are against to assisted dying on the ground that life is sacred and once can live longer period where god wishes. Further, Christians believe that no one can permit the killing of innocent person if it does it is the violation of divine law. According to Hinduism there are two views on euthanasia. That is one who put an end to the life is fulfilling moral obligations and other view is that who perform euthanasia will invite rest of patients Karma. It can be observed from the above religious belief that in all these religions it is god who created this life and only he can take a life of human being.

Keywords: Euthanasia, Christian View`s, Hindu`s View`s, Muslim Views, Karma.

INTRODUCTION

The discussion on legalising euthanasia in India has intensified significantly over the last few decades. The reason being in a developing country like India with rapid advancement in the medical technology changed the manner of dying process for a majority of people. Even if modern medicine cures majority of viral diseases, the dying process in the case of Aids, Cancer, stroke etc. can be a prolonged one which might involve high medical expenses and intense suffering. The family members witnessing their intense and prolonged suffering of their dear ones who would like to have the option of euthanasia¹. The English philosopher (1561-1621) Francis Bacon coined the term `Euthanasia` first time in the medical context during 17th century referring to a happy death. In modern days euthanasia is described as `painless death``. However oxford dictionary describes it as `painless killing of a patient suffering from an incurable and painful disease``. The question of medical ethics is whether medical profession involve both caring and killing. Within the narrow context of law euthanasia is strictly complex. It raises a questions of ethics and moral theory. At the same time it is interesting to observe the debates on the euthanasia.

Euthanasia may be classified as active and passive euthanasia. Active euthanasia includes, voluntary, non-voluntary and involuntary active euthanasia¹. Voluntary active euthanasia means a patient with conscious effort asks for death and non-voluntary active euthanasia means a patient is being killed in his best interests but his wishes are unknown⁴. On the other hand in involuntary active euthanasia at the best interest of patient is killed but against his wishes. In case of passive euthanasia death causes because of omission or withdrawal of life support given to the patient. Jackson in her book argued that, assisted dying should not made compulsory who raises objections and she concern to provide option in certain cases⁴. Those who wishes to live or opposed euthanasia should be allowed to live and should not force them or thrust upon them. We should allow them to die as per their wishes. She spoke against individuals who argued for assisted dying.

Due to change in healthcare delivery system and globalization there has been gradual change in attitude and perspective of people with respect to euthanasia. During early modern period euthanasia was defined
as skilful alleviation of suffering in which physician were expected to provide gentle conditions of death with informed consent of patient or patient party. The varied perspective and the controversial nature of euthanasia has led to doctor’s dilemma. Cases of advance diseases like cancer at a terminal stage causing extreme pain and suffering, cases of neurological disorder causing permanent disability have increased the proposal for euthanasia. It is against law to shorten a human life and physician are expected to prolong life and relieve suffering. On the contrary Euthanasia is an act of relieving suffering by shortening patient’s life. Studies have shown every case has different perspective on euthanasia, thus it has turned out to be the most controversial issue in healthcare scenario.

**LAWS AND REGULATIONS RELATED TO EUTHANASIA IN INDIA**

Although there is no specific legislation in India with respect to euthanasia, Supreme Court of India passed a landmark judgement on March 2011, permitting passive euthanasia in India. It also directed the government to re-look into section 309 of Indian Penal Code in which attempt to suicide is a punishable offence. Court also viewed euthanasia including administration of lethal compounds are criminal.

The Supreme Court of India permitted passive euthanasia with two conditions. First Ventilator support can be withdrawn for the brain-dead patients. Second, for patients in Persistent Vegetative State (PVS), feed can be narrowed and addition of palliative pain killers.

As India had no specific law for euthanasia, the guidelines of Supreme Court are considered until parliament passes legislation. The decision for discontinuing the life supports has to be taken either by the patient or patient party. The decision can also be taken up by the attending doctor. It should be noted that the decision of the doctors taken must be at the best interest of the patient. However the decision for withdrawal of life support taken up either by near relatives or doctors only after the approval from concerned High Court of the state which he belongs. After receiving such application the Chief justice of the High Court should constitute two judges for decision of approval of the petition. The committee must be formed comprising of three reputed doctors to be nominated by the bench which has to submit a report about medical condition of the patient. A notice addressing the report should be passed to close relatives and the state before giving the verdict. After hearing the parties High Court can pass the verdict.

**ISLAMIC VIEW**

Islam believes that God (Allah) gives life and he alone has control over death of human being which mean that only Allah has an authority to take life (Qur’an 16:61). To Muslims, Allah is the creator of life and only he has the right to take it at the right time no matter how the conditions of the patient, still there will be a hope for survival. Islamists are against assisted dying on the ground life is sacred and it is gift of god. He can live longer period where god wishes and no one can interfere on it. To be strict in an Islamic setting the concept of euthanasia more often than not does not emerge, and in the event that it does, it is viewed as unlawful as per their religion. In such situation the patient must get continuous mental backing and empathy from their companions. The doctor has obligation to provide the healing measures for the relieving of pain. They collectively believed that human life is blessed that it is given by Allah and Allah decides the extent to which the individual should live. We ought not to interfere in this. Islam restricted killing and it views “*Do not take life, which Allah made sacred, other than in the course of justice.*” When anyone is in torment or enduring extreme illness, he should be willingly admit it and he must attempt to get better treatment. It is additionally Haram for a specialist, a medical caretaker, or some other individual to complete the patient’s solicitation, regardless of the possibility that their infection is hopeless. Any individual who helps with this shares in the transgression, since they purposefully murder a human, whose life is secured by Shari’ah (Islamic law), without a privilege. There are clear Nas (Islamic writings from the Qur’an or the Sunnah) prohibiting the performing of a person without a privilege. Life is blessed and sacred. “*Allah is the one who gave your life, than shall he ordain you to die, then shall he give you your life again*”.

**CHRISTIANITY VIEW**

Second Vatican ecumenical council upheld the dignity of human being and it condemned crime against life. It regard life is sacred and no one can dispose of it at his will. It also opines life is a gift of god’s love, we
must preserve and make fruitful, so it urges that no one can take the life of innocent person by opposing god’s love for that person and it is the duty of every ones to lead his life accordance with gods wishes whatever the kind of euthanasia it is as wrong as murder and it is considered as rejection of gods sovereignty. It firmly states no one can permit the killing of innocent person including himself, if does it is the violation of divine law and crime against dignity and life of human being. It is misunderstood that, if someone ask for euthanasia, we will think he is asking for death but it should be imply that due to pain it is anguished plea for love and help.

Thus, Catholic view is completely against good death which describes ‘crime against life and crime against god’. They propagates principle of sanctity of human life and the dignity of the individual. They call euthanasia mercy killing i.e. ending one person’s life to reduce their suffering from any pain. They oppose euthanasia based on their beliefs and values. They assume that human life is given by god, and they don’t want humans interfering with the natural process of death, they fully oppose euthanasia and physician-assisted suicide. They believe that before god every individual is responsible for their life, who has given it to them. God is a sole master of human’s life is what is believed. “Thou shall not kill” they assume that taking god’s sacred gift of human life is wrong or unethical.

“God made human in his own image”, so god is the main sovereign master of the human life he has to decide the death of a human. They believe that Jesus healed the sick but he did not kill the people, so Christians must to help others who are suffering from disease, not to kill them. Humans have a right to use their god’s gift and not for end it. In Christians view killing is always wrong. Killing themselves is like opposing god’s love for that person. They tells that “we will not to use unethical practice or unwanted benefit therapies which kills the person. In spite of that we have to respect our life which is given by god, we have to love our natural life”.

Christians believes that after the death of a person he shall be judged and then enter heaven or hell. They consider that euthanasia is always wrong, people must be allowed to die. But not by physician assisted suicide or euthanasia they should end up their life when god decides. “Euthanasia is a grave violation of the law of god”. To the Christian quality of life judgement is irrelevant. Because each person were created in the image of god each person life has its own value all life has meaning and purpose. Christianity will respect every human being. They don’t accept human being have a right to die. There is a limit they can’t go beyond the limit as in they does not have a right to end their own lives. Suicide and euthanasia both are rejection of god. Every person has the right to live.

The Roman Catholic would not accept that every person has the right to die. They just oppose the law which is supporting euthanasia and physician assisted suicide. Euthanasia covers various situation which is not morally similar Christians not only oppose euthanasia but also they oppose legalisation. Christianity wants to respect every human being.

However, some Christians argue for euthanasia on the ground love. Christianity is all about love, keeping the person in pain and suffering is evil, not love. They argue that euthanasia can be the best way of putting love into action. God has given all the rights to humans over all the things. So they can choose for their selves. Euthanasia is good rather than suffering from lack of quality of a life. God gave free will to the humans so he must be allowed to judge when his lives end. Treat the people how would you want to be treat by others.

**HINDUISM VIEW**

In Hinduism the purity of rebirth and soul’s future depends on persons actions in the present life. To understand euthanasia from the Hindu standpoint one must understand the law of Karma (acts), Moksha (Liberation) and Ahimsa (Non-Violence). According to Hinduism, Vedas (set of four Hindu holy texts such as Rig-veda, Sama-veda, Atharva-veda and Yajur-veda) states man has two trustworthy friends i.e. Vidya and Mrithyu. Vidya is knowledge which is required in life and Mrithyu is death which is inevitable. Euthanasia is not an act of sin to reach moksha and one can be permitted to end his life. There is also two views on euthanasia i.e. one who put an end to the life is fulfilling moral obligations and other view is that who perform euthanasia will invite rest of patient’s karma. Hindus also believes that Yamraj is a king of death and dying are fetched by Yamadutas. Suicide and mercy killing morally wrong who goes hell. Only god can take life of human being.
In Hinduism end of life is rooted in three main values

- Karma (acts)
- Moksha (liberation)
- Ahimsa (non-violence)

Karma can be defined as outcome of good and bad deeds of a person’s life, which highlights the nature of the next birth. Good karma takes one to moksha. The person who does good things or good karma will get liberation from the cycle of rebirth. The Continuous practice of bad karma prevents from moksha. The ultimate goal of Hindu religion is moksha. Ahimsa is a fundamental principle of Hindu dharma. Ahimsa is the meritorious form of dharma which means non-violence, non-injury or non-killing. The main belief of Hinduism is in “Sanathana Dharma”. Dharma means both law and religion. It guides moral duties and responsibilities of a person to lead a good life to get moksha. Euthanasia and suicide are treated as bad karma in Hinduism which prevent from moksha. As per karma theory doctor should not go for euthanasia. It is a process of separating soul and body unnaturally. It damages karma of not only a doctor but also of patient. In Hinduism suicide is completely prohibited which yields bad karma in turn disturbs the time of the cycle of death and rebirth. It also results in bad consequences for the soul’s spiritual progress.

Killing of a person in ways of suicide, murder and euthanasia interferes with the killing soul’s progress towards moksha or liberation. It must be remembered that retaining a person artificially alive on life support machines is treated as a bad thing. In Hindu views the ideal death is a sensible or conscious death. There is a chances of reduce of mental alertness due palliative treatment so it is treated as a problem. Ones state of mind which leads a person to opt for euthanasia may affect the process of rebirth. All Hindus may not agree on whether euthanasia should be permitted or not. Due to different perspectives the opinions of individual will differ. According to some perspectives, one who helps to end painful life may get a good karma and others perspective, euthanasia may lead to bad karma and which interrupts the cycle of death and rebirth.

CONCLUSION

Some views euthanasia is intended to bring an end to the suffering of the patient. As per the experience most of the physicians claim Euthanasia as the ultimate way to relieve pain of patient suffering from incurable disease. The major cause for the proposal of Euthanasia as determined by the physicians is to bring an end to the suffering of the patient and not the financial or emotional burden on patient party. It is also believed that Euthanasia will be misused or exploited once legalized for personal or other benefits. Hence, the subject remains controversial because of varying opinion, religious views and proportionate pros and cons of Euthanasia legalization.

REFERENCES

Polarization in the Arab World of the Youths through Social Media

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ABSTRACT

The study sheds light on the phenomenon of Polarization in the Arab World, whereby youths and adolescents are being recruited by radical groups, operating through social networks.

There have been many recent examples of terrorist incidents that emphasize the seriousness of this phenomenon, taking place in many Arab and Western countries.

The evidence confirmed that the young people who were caught in Clutches, inspired by intellectual radicals and terrorists, were subject of direct influence of individuals and groups promoting a culture of extremism through accounts on such social sites as Twitter, as well as YouTube and other forums that broadcast material of extremist nature.

One of the reasons for the spread of this phenomenon is the increase of social media use among all age groups, yet the most affected and responsive categories are adolescents and young people. They are drawn by means of emotionally charged religious discourse urging them to break away from society, calls for the use of violence, and uphold symbols of extremism.

The study is concerned with clarifying the importance of the role of the media due to its great impact on public opinion and communities, as well as providing guidance to young people, and drawing the attention of officials and decision makers.

The study also emphasizes the need to observe and analyze the thinking patterns promoted by of the extremist ideology, detect the strategies used for advertising, in order to have access to how to confront this thought, so as to protect Arab youths.

Keywords: Role and Influence of Media -Social networks; Extremism thoughts; Awareness; Polarization

INTRODUCTION

Terrorism has become one of the most widespread crimes that impact the society. This is evident in the latest incidents in Egypt and the whole world which prove the persistence of this phenomenon despite the big efforts to control it. The advancements in the scientific and technological revolution which led to unprecedented developments in the means of mass communication and modern information technology have helped the emergence of a new type of terrorism which is “terrorism without limits and without face” which victimizes users of social networks. This type of terrorism is becoming increasingly dangerous and has been expanding to many countries and continents, exploiting technological applications to attract young people and adolescents. They are the most vulnerable age-group when exposed to intellectual extremism. The research problem of this study comes in this context and it tries to answer the following questions:

Research Questions:

1. What pushes the Arab youth to fall prey to intellectual extremism?
2. What strategies do terrorist organizations adopt to attract and recruit young people?
3. What is the role of Arab media in facing this phenomenon which threatens our societies?
It is imperative on researchers to study and analyze this phenomenon to find solutions for it. There is no doubt that the lack of a specific and unified definition of terrorism poses a strong challenge to those who confront this socio-political dilemma.

**A stretched, non-standard definition:** Historically and linguistically, the word and concept of “terrorism” has originated in the West and then travelled to the East, and survived in the contemporary world. It has penetrated all norms and barriers and created much ado everywhere. Although terrorism is a threat to the security and safety of individuals and countries and also to national stability and sovereignty, there is no one definition of terrorism as we have mentioned, and this is one of the most important challenges that face countries combating it. Until this moment, the international community has failed to reach one unified definition of terrorism. The reason for this may be the different ideologies adopted by different countries concerning this phenomenon, and this has caused a chaos in definitions, although everyone agrees that it takes the forms of criminal acts that frighten and terrorize people to achieve certain goals. Linguistically, the most popular French dictionary “Larousse” defined terrorism more than 50 years ago as follows:

"Ensemble d’actes de violence (attentats, prises d’otages, etc.) commis par une organization ou un individu pour créer un climat d’insécurité, pour exercer un chantage sur un gouvernement, pour satisfaire une haine à l’égard d ’une communauté, ou d’un pays, ou d’un système."

This can be translated in English as follows: “All forms of violence (e.g. attacks, taking hostages, etc.) committed by an organization or an individual to create a climate of insecurity, to blackmail governments, or to satisfy a feeling of hatred towards a specific community, a state or regime.”

On the legal level, the concept of terrorism entered this field for the first time in the first conference on the unification of punitive law held in Warsaw, Poland, in 1930. Since then, attempts to develop a comprehensive definition of terrorism have not stopped. In this context, Abdel-Aziz Sarhan defines terrorism as

Every aggression on lives or property whether public or private in violation of public international law with all its sources, including the general principles of law as defined by article 38 of the Statute of the International Court of Justice. The aggression is considered international terrorism and therefore an international crime, whether perpetrated by an individual, a group or a state.

In spite of the widespread threats of terrorism, there is no international consensus on its nature: Most world leaders and peoples see the activities of armed opposition groups as criminal acts aiming at terrorizing citizens and destroying state institutions, while those groups and their supporters regard these actions as a natural reaction to the corruption and oppression of the ruling authorities. Most researchers and analysts of terrorism agree that in this case, terrorist acts have a political dimension in that such acts of violence are not motivated by personal factors or aimed to achieve personal gains. On the contrary, the perpetrators consider themselves advocates of a just cause to which they want to attract the world’s attention.

Attempting to reach a standardized definition of the phenomenon of terrorism in the field of the media, it has been suggested that it is a form of communication characterized by threats and violence and it is a tool of coercive persuasion. The idea of persuasion in this definition raises concern and urges us to adopt a precise approach to understand how terrorist organizations convince their sympathizers to adopt extremist thought which deviates from what is right and from the essence of Islam.

Trying to reach a unified definition, sociologists and psychiatrists have suggested a set of characteristics that are common among terrorists and individuals who have a tendency for violence. The most important ones are: self-exaltation, constant anxiety and stress, misunderstanding others and explaining their motives in a negative way, personality disorder, ideological extremism and strictness, defying social norms, values, customs and traditions, breaking the law, adhering to the teachings of a certain extremist group more than adhering to religion itself.

Means of mass communication, especially social networking sites, also play a major role in this area. Unfortunately, they are a mixed blessing because they can be used in a negative way as they can be used in a positive way. Just as social networks can contribute to combating violence and extremism, they can also spread these phenomena.
The Internet Revolution has made a drastic change in global communication, making it possible for all citizens of the world, so to speak, to communicate using social networks, most notably blogs and Facebook which became a new public network that connects millions of people. Also, Twitter has become a platform for people to express their views on national and social affairs. Among the reasons that made extremist and terrorist organizations use social networking sites to recruit young people are the speed of news circulation, getting rid of facebook and twitter accounts very easily and the extreme difficulty with which security authorities try to detect or track the source of danger.

In this way, social networks have been manipulated by terrorist organizations to propagate their extremism and recruit young people not only at the national level, but also at the international level. This tells us that social networks have become a dangerous weapon in the hands of terrorists who have become able to have a direct impact on young people and on societies. In a survey that we have conducted to explore young people’s use of the internet and social networks and to know their opinions on whether the internet plays a role in terrorism, 80% of participants said that the internet plays a big role in attracting supporters, especially among young people.

ARAB YOUTH AND DIGITAL TERRORISM

The revolution in information and communication technology has greatly attracted the Arab youth to that tempting virtual world where they spend most of their time for a variety of reasons, including those looking for information or work, and those looking for entertainment or something missing in their lives such as adventures that they want to have without any restrictions or costs. The internet gives them the illusion that they can lead an exciting life that is free of restrictions and without having to even leave their homes. This parallel/virtual life may allow them to see themselves in a way they lack in real life. Some of them may suffer from marginalization, lack of clear goals or significance in their families and some have no interaction or influence in the society.

We must not also overlook addiction to the Internet which affects this group of young people. It is a central issue that is exploited by extremist groups. The survey shows that about 85 percent of Internet users are between 13 and 24 years old. They quickly become addicted to this virtual life which is free of all restrictions and rules and which gives them the feeling that they are great heroes. This can also be a major reason why large numbers of young people and adolescents resort to this virtual world where they spend most of their time playing video games or interacting with other real people.

They are usually attracted to some games. For example, Babel: The Royal Conflict. The events of this game take place in an arena similar to Roman theaters where all the contestants and the audience in the game are real characters who can interact with real feelings, especially in the fight scenes. The game also allows the players to personalize the characters to give them stronger and more realistic feelings. This is one of the most tempting elements in the game which also allows them to do things that they cannot do in real life such as dangerous and deadly risks which create strong feelings of excitement as if in real life. This leads to alienation and isolation of the players from reality and from people in their social environment.

This kind of games attracts a large number of young people to the virtual world and to the “augmented reality” technology which result in addiction to these very interesting games. This prepares young people to drift easily to other temptations on the Internet in search of different forms of games or entertainment that give them stronger feelings of excitement away from parents’ supervision. In fact, this is one of the most dangerous aspects of the Internet: addiction, isolation and lack of parental supervision. There is evidence that this group of young people are intelligent which is evident in their effective use of these modern technologies. However, the main problem, as we have already mentioned, which should not be overlooked, is addiction to the Internet which is the result of unemployment. This is an ever increasing danger in Arab societies because it exposes the youth to extremism, terrorism, crime, drugs, assaulting others, theft, etc.

Perhaps psychology can provide us with some important explanations of ideological extremism and terrorism to which young people are exposed thanks to its interest in studying the dynamics of these groups, their strategies of influence, persuasion techniques and changing attitudes, the transformation of the individual from being a good person to an evil one as well as the psychology of obedience. Our interest in psychology emanates from the fact that terrorist organizations like ISIS have used psychological methods and theories.
very effectively and in an unprecedented manner to recruit the youth. This shows that they manage their media discourse very professionally and use serious psychological research to attract supporters. Therefore, we must understand and analyze these strategies.

**Some polarization discourse strategies:** Personality traits, psychological willingness and tendency towards a particular behavior are shaped by the individuals’ upbringing and the social environment in which they live. This makes some individuals more likely to be influenced by extremist ideas and more willing to carry out acts of violence than others. If a child suffers from deprivation or cruelty, there is a bigger possibility that he may grow up harsh and cruel to others. He might even deviate from social norms and defy everything that is standard and accepted in his environment.

One of the basic needs of any individual is the need for a purpose and meaning in his life and a sense of appreciation in the environment in which he lives, as Maslow emphasizes in his psychological theory:

![Maslow's Hierarchy of Needs](image)

Extremist groups’ polarizing discourse employs this strategy so effectively, as it seeks to fill the void that some young people have in their lives due to the absence of clear goals from their lives or because they suffer from a feeling of worthlessness or marginalization. Moreover, terrorist organizations offer some rewards to potential members in that they offer them the opportunity to join the elite who seek to achieve a noble goal such as “exterminating the infidels” or “achieving martyrdom”. These are promises to achieve high status in life as fighters in the cause of God, and at the same time get the best reward in the hereafter by entering Paradise and getting married to houris (beautiful virgins)! This is a very effective strategy on many recipients, especially the youth and adolescents because if one of them believes that a certain action will admit him into Paradise, he will sympathize with it and will be easily attracted to the organization or group that will help him achieve this noble goal.

**Exploiting the feelings of frustration and opportunities for revenge:** Generally speaking, extremist organizations and terrorist groups try to arouse anger in young people against different aspects of their lives and their society and to push them to have revenge. Those organizations have an extraordinary ability to exploit the feelings of frustration and despair in young people to serve the purposes of violence and terrorism, especially if those young people are psychologically fragile, have weak characters and cannot resist pressures or temptations.

The poor economic situation is one of the most prominent causes of moral deviation and ideological extremism, because the economic status is one of the main factors that create psychological stability in the individual’s life. Therefore, if a person’s income is unstable, this negatively affects his psychological state and creates a feeling of dissatisfaction which may even develop into hatred of the society. It can also undermine the sense belonging and responsibility towards one’s country. Eventually, this can create the desire to retaliate which is manipulated by the enemies of the country who can deceive him by convincing him that they can improve his economic situation, and he gives in to their plans without considering the consequences.

**The hero model:** The sense of success is among the basic needs of human beings, and young people aspire to be heroes and great achievers and to be appreciated by others. Extremists exploit this need when they make the youth feel that they can be heroes but according to their own concept of heroism. The danger multiplies when young people view extremists and terrorists as revolutionary figures as was the case with Guevara and others, especially that some young people look up at such figures as a result of their feelings of rejecting the society and parental and political authority. They search for an alternative role model.

**Obedience and Conformity:** This is another important strategy used by extremists to attract young people. It depends on destroying personal independence and merging the young man into a mode of collective thinking and blind obedience to the group’s ideas and thought. The message communicated by extremist and terrorist groups to their followers is: Follow me and I will take you to achieve your ambitions, and that there is no need to think independently or act according to personal convictions! In this way, they undermine individuality and program each person to carry out the group’s agenda.
Misconceptions: These ideologically extremist organizations do not only exploit religious feelings to attract young Muslims and call on them to participate in holy wars by misinterpreting Qur’anic verses and cutting them off their contexts to serve their bloody and political purposes, but they also describe the Islamic identity and cultural history in vague terms to alienate young people from their history. They also manipulate some concepts and terms such as openness, gender, hostility and rejection of the other, and empty these terms of their true meanings.

After reviewing the report prepared by the Conflict Resolution Program of the Carter Center and analyzing some speeches by a terrorist organization like ISIS broadcast on social media and the video clips on its pages including various scenes, picture reports as well as its bulletins and magazines (the most famous of which is “Dabeq” which is translated into more than 16 world languages), it becomes clear that ISIS (aka Da’esh) is greatly effective in communicating with young people in their native tongues and recruiting them from all over the world. It is not an ordinary terrorist organization, but a sophisticated body that employs very advanced and complex communication strategies that attract sympathizers from diverse demographic groups across the five continents as a result of the void left by moderate Islamic discourse and in spite of the many national programs that aim at protecting young people from terrorist recruitment.

The report also mentions that what really catches attention regarding the strategies used by ISIS to attract supporters is that it adopts a complex and effective method in stirring seditions in the communities it targets to serve its schemes. This method has three basic components: emotions, perception and behavior.

ISIS tries to communicate its audiovisual and printed discourse to the audience to achieve certain effects on them like intimidation, polarization, threatening and escalating a certain situation. First, they stir the audience’s emotions through sound effects, songs, anthems and playing on some issues like persecuting Muslims globally. They also manipulate Qur’anic verses, hadiths and events from Islamic history. Communicating this message to the recipients’ minds turns it to the second phase which is perception but it is incomplete and distorted. This results eventually in behavior which prompts the sympathizer to join the terrorist organization, adopt its beliefs or sympathize with it. In case the individual does not literally join it, he remains a potential member anyway. Through its messages, ISIS instills fear and confusion in its opponents and enemies. It is the same methodology and approach followed during the 9/11 attacks: spreading fear, panic and terror in the whole community of something vague and unknown that kills innocent civilians in cold blood.

What is worse is its exploitation of the media to achieve its goals. The role of the media is to disseminate the news and events in real time, and this is exactly what terrorists want: intimidating the largest number of people possible and spreading fear through multiple media channels. Perhaps this is what has highlighted the phenomenon of terrorism in modern times. It has been catalyzed by the tremendous progress in communications technology and the emergence of satellite media which reach great masses so efficiently. Many media research studies findings point out that different media channels play an effective role in raising the citizens’ awareness of political, social and economic issues in their societies. But they also contribute a lot in shaping the public opinion and influencing its trends.

Therefore, our world today is shaped more by the media than the truth itself, and the way the media represents reality has become stronger than reality itself.

Digital media and terrorism and the causal relationship between them: The media plays a very important role in the society; in some communities, it is a source of educating and guiding individuals, and developing their intellectual level and social awareness. It should be noted, however, that in recent years, many negative and dangerous aspects of the media have surfaced so much that they came to overshadow its positive aspects.

Among the negative aspects of the new media is broadcasting terrorist actions that shock the recipients
such as the video clip showing the incineration of the Jordanian pilot and the slaughter of Egyptian victims in Libya as if these were movie scenes! The media has also shown us ISIS terrorists’ black clothes and weapons that instill fear and panic and convince young people that they are strong and undefeatable. Terrorists know that such use of the media is the best way to influence young people1.

However, the main aim of terrorists is to win people’s sympathy through their propaganda campaigns as well as psychological and media warfare. Terrorist groups aim to communicate certain messages to people through traditional and digital media. In this connection, Walter Laqueur states that:

“Terrorism per se is not a big deal; its circulation in the media is what makes it what it is.” In the same connection, the Turkish researcher Asfat Talljan says: “The terrorist action itself is the beginning of a more complex process that also includes propaganda. A terrorist group will be anything but happy and even disappointed if its crimes are not discovered, and if they cannot attract the attention of society5.”

Therefore, the media, specially satellite media, has become the most powerful weapon in the hands of terrorists. Destructive, terrorist acts attract the attention of the media, and this enables terrorists to use it to serve their purposes, especially in countries where private and commercial pluralistic media is available. That is why the media is one of the most important pillars of terrorism. Moreover, the first thing a terrorist usually plans to do is to make his terrorist action catch the widest scope possible of public opinion.

There is a consensus among researchers that this interrelationship between the media and terrorism is not necessarily a direct one, but it can be based on mutual interests. Some media specialists believe that this relationship takes the form of partnership between two institutions: one creates terrorism and the other markets and propagates it. Propaganda is part and parcel of media work and there is this kind of propaganda which is known as “unintentional propaganda” which denotes the set of factors and circumstances that make a news coverage a form of propaganda even though it is not intended to be so by the broadcasting institution.

The propaganda effect of the news can be stronger than the news themselves because viewers listen to news as reports of direct facts. However, in practice, these facts are being carefully selected and manipulated or even omitted, intentionally or unintentionally from the report. This kind of manipulation is practiced by media people who know very well the effect of what they are doing. Since the primary function of the media is to inform people of what is happening in their societies, we find that they focus on terrorist actions with such zeal and enthusiasm that can be exaggerated sometimes to achieve certain purposes. In fact, some media channels highlight people’s panic and fear resulting from the violent events which leave deep psychological impacts on the viewers. Therefore, a news coverage is turned into a propaganda campaign that spreads the news about terrorists.

We cannot deny the impact of media analysis of violence and terrorism on creating a certain public opinion that supports or opposes it, but this does not mean that the freedom of the media is a cause of terrorism. On the contrary, imposing restrictions on the media, the lack of freedom of expression and the blocking of information are factors that may lead to an extremist, and even a terrorist, ideology, especially that the world is witnessing an information revolution that allows all people, including terrorist groups, the freedom from all traditional restrictions. We cannot even ignore the mutual interest between the media and terrorists either. And although the media has helped the public to understand some terrorist actions and strategies in which these actions are carried out, we have to be very careful when we deal with terrorism, and not exaggerate events or blow them out of proportion in the media.

The role of the media and social networks in combating intellectual extremism and terrorism: Plans of fighting terrorist thought and ideological extremism cannot be successful without a clear media strategy in this confrontation. We have to raise real awareness of the seriousness of the ideological war waged by terrorist groups to dismantle the institutions of the state which protect the society: these are security forces, the army, intelligence agencies and internal security. It is therefore necessary for media institutions and social media actors to coordinate in formulating national media policies in relation to the issues of terrorism and national security. They must not deal with terrorist atrocities simply as ordinary news or media scoops, but as aggressions and real threats to the state and society. Media people, especially program presenters, should be trained to conduct impartial and objective treatment of terrorism-related issues5.
We should also intensify our efforts to identify media terminology and standardize it in the treatment of terrorism in order to create a media discourse based on objective and professional approaches. This includes a unification of new terms used in the exploitation and implementation of terrorist actions and in the media coverage of extremist groups. More importantly, we should also create a preventive media discourse to protect young people from extremist ideology and its appealing discourse.

The problems of the youth should be catered for, and they should be involved in developing strategies that enable them to build positive communication with their communities in order to protect them from extremist ideology and terrorist groups.

A Positive and Outstanding Example of Wise Leadership: It is worth mentioning that what we have mentioned so far does not apply to all Arab countries. For instance, ever since the establishment of the United Arab Emirates, Sheikh Zayed bin Sultan Al-Nahyan, may he rest in peace, started his wise rule with paying special attention to the issues of the youth that he regarded as the “real wealth” of the country. This wise leadership continues till today by following on the footsteps of the late Sheikh Zayed, may he rest in peace. The state takes great care of the youth and involves them in the National Strategy to Empower the Youth in order to invest their talents and engage them positively in the society. This initiative shows the state’s keenness on providing all opportunities for young people, both male and female, to participate effectively in the progress of the United Arab Emirates and the whole world. It also emphasizes the status of young people as a vibrant creative power at the center of any national development.

Young Emirati people are among the state’s first priorities. This is what has created a patriotic and tolerant generation. It is the outcome of the leadership’s firm belief that young people, who have a sense of national belonging and are armed with knowledge, are the ones who can assume responsibility and guard national achievements. Therefore, the state provides the youth with opportunities to qualify them to participate in decision-making and to play a role in the ongoing development by strengthening various positions of leadership with new blood.

The methodology of the United Arab Emirates is an example to follow in that the leadership gives ample care to the youth. This has been an old approach ever since the days of the late Sheikh Zayed, may he rest in peace, who believed that young people are the true wealth of the nation, and the shield that protects it. Sheikh Zayed believed that young people had the power to shape the present and the future alike.

RECOMMENDATIONS

In light of the current understanding of the great impact of social networking sites on users, we should adopt a unified and purposeful strategy to confront extremist groups that recruit sympathizers by persuading them of their extremist and terrorist ideologies. To counter this danger, we should use social networking sites to promote moderate thought and clarify that these ideologies are misleading and misguided because they do not have anything to do with the true essence of Islam. In addition, we should also tighten our security grip and increase surveillance of these sites and monitor what is going on on them in coordination with the international community to arrest individuals who propagate terrorist ideology and practice violence against countries and innocent people to achieve fame, promote their ideology or show off their power.

It is also necessary to intensify international cooperation in the field of security training to combat cybercrime, especially terrorism-related ones like the recruitment of terrorists through social networking sites. This is imperative because terrorism poses great dangers to national, regional and global security. This requires coordinated action to combat it by taking special international measures like facilitating information exchange and prioritizing national security over considerations of sovereignty because such crimes threaten the security of our countries.

When it comes to young people and adolescents, we should encourage them to produce an anti-extremist discourse to combat terrorist ideology. They should not be left to be passive recipients, but we should open up for them discussion forums to enable them to express their opinions and take part in formulating educational, social and economic development plans and programs.

RESULTS AND FINDINGS

Until this moment, there is no internationally-unified definition of terrorism.
Evidence allude to the scarcity and limitedness of institutions traditionally entrusted with safeguarding youths against deviant thinking.

Mass media, the satellite one is particular, has become the weapon most tactfully wielded by the terrorists.

The majority of servers supporting social media sites are evidently located in places that are beyond the control of Arab countries.

Cooperation in the field of security is proving difficult to realize, as acquiring information about any suspicious social media account requires obtaining a court order, in accordance with established regulations.

**CONCLUSION**

By the end of the study, it is evident that terrorism and extremists thinking are exploiting the fact that Arab governments and regimes are preoccupied with social and economic difficulties, hence oblivious to the issues of the youths.

Among the reasons for ideological deviance is the defective reading and exegesis of the scripture, twisting it to bear unintended meanings. Hence, knowledge and enlightenment do serve as the most potent tools in combating terrorism and extremism.

Media has a focal role to perform in this battle, as it should spread awareness about the gravity of the mental warfare waged by terrorist groups, aiming primarily against our youths.

Terrorist incidents should not be treated as mere opportunity of scope for the media outlets. Rather, these incidents should be viewed as acts of aggression against the safety and sovereignty of the state and the community.

Mass media institutions should not provide a space for opinions and analyses the serve the ideology and interests of the terrorists and extremists under the pretext of impartiality or freedom of expression. There can hardly be a neutral position in combating terrorism.

Mass media should rather intensify its awareness campaigns, increasing public knowledge of the possible negative effects of the use of social media, while revealing to the public the means and strategies that are adopted in such site for the recruitment of youths.

Educating the youths and consolidating their awareness is by no means an exclusive task for the mass media. Such a complex social issue constitutes a responsibility that falls on all institutions and concerned entities in the society that should play a more eminent and effective role. Such role is hardly felt in a society where organizations that should by concerned with the protection of youths against deviant thought are so limited in number.

The role of the family as a caregiver, source of moral inspiration and vital actor in the eradication of extremism and aberrant thinking from the lives of its members, should not be sidelined. A family needs to have a dialogue about issues that touch their life together, provide mutual consultation about their future, in a way that would foster their familial bonds, and consolidate their presence as the solid building block of the society.

Ingraining the love of one’s homeland, strengthening their attachment to it, is a must for the youths. So should be the respect for leaders and institutions of the homeland, which should be a legitimate and furthered conviction for the youths. Such would positively reflect on the youths, enhancing their societal integration, encouraging them to play more constructive and participatory roles, which would lead to the progress of the state.

Setting a distance between youths and such harmful states of mind as seclusion, alienation and hatefulness should be a serious endeavor, and as a part of their upbringing should be the appreciation of gift of safety that needs to be maintained and never violated.

Youths need guidance on the proper use of social media and tools of modern technology, as well as a proper monitoring of the online and offline sources providing them with information.

Self-regulation should be trait that is further instilled in youths, as a part of the refinement of their characters, so as to be better representatives of their countries, and contribute more to their abidance by the dictates of morality, the teachings of their faith, as well as the authentic morals and customs of Arab nations.

Finally, ties of international cooperation should be established between Arab countries and the world for the combating of terrorism and aberrant ideology, with a goal in mind of protecting the youths and ensuring safety, security, and sovereignty of all countries.
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Ownership Concentration, Corporate Governance and Firm Performance: Evidence from Pakistan

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ABSTRACT

Purpose: The purpose of this study is to shed light on the relationship between ownership concentration, corporate governance and firm performance.

Design/methodology/approach: To conduct research, 60 non-financial firms, listed at Pakistan Stock Exchange are selected and data is extracted from the yearly reports during the period of 2011 to 2016. Firm performance is measured by two indicators. One is market based performance measure that is Q ratio or Tobin’s Q and other is ROA i.e. Return on Asset which is accounting based measure. Ownership Concentration is measured through the percentage of largest shareholders/total number of share and Corporate governance is measured through six different indicators i.e. Managerial Ownership, Board Diversity, Auditors’ Reputation, Board independence and Board size. Panel data is used to estimate the model.

Findings: Study reveals that ownership concentration is negatively associated with Tobin’s q. Similarly, board diversity and leverage is negatively related with Tobin’s q but managerial ownership, auditors’ reputation, board size, board independence and firm size have a sanguine effect on market based performance indicator i.e. Tobin’s q. In second model, ownership concentration, managerial ownership, board diversity, auditors’ reputation, board independence and leverage is positively linked with return on assets whereas, board size and firm size is negatively linked with ROA. Results are consistent with previous findings.

Keywords: Corporate governance, Ownership Concentration, Performance, Managerial Ownership, Board Diversity, Auditors’ Reputation, Board independence, Board size

INTRODUCTION

Today, Corporate Governance has become an inevitable topic for discussion in corporate roundtables, academic boardrooms and for policymakers around the globe. There are numerous factors responsible for heightened the pace of corporate governance importance. Over the last decade, subsequent demand for continuous improvement, disclosure frequency, timeliness of information and rapid change in economic environment has enlarged the demand for corporate governance. Pakistan is a developing economy and corporate governance is a developing concept but with recent Gwadar and CPEC projects has indeed attained the attention of global players as a sound opportunity. Therefore, corporate governance role has become more crucial in this context because international firms are well aware with the concept and would likely to demand those practices here also. The proposed research framework is opted to find out whether sound corporate governance affects the transparency of firms working within Pakistan.

According to study corporate governance is a mechanism developed over the course of time to resolve agency problem within the organization. The agency problem is, in fact, arises due to the separation of ownership and control between the owner (the principal)
and the controller (the agent). Usually, they are incomplete in the sense that they do not cover their full responsibilities. It is stated that corporate governance is associated with the governance of corporate entities\(^1\). The corporate entity is not confined to only one company but it includes a business. Corporate governance mainly focuses on the wealth of the business. It also provides protection to the rights of stakeholders from exploitation. Another study stated in his research that governance scholars have demonstrated by reforming corporate governance policies which showed a firms’ performance not only increased but also it helped to build his strong image within the economy\(^8\).

Over the years, corporate governance has emerged as crucial element towards the success of an organization. A sound corporate governance policy contributes towards the economic stability of the firm which leads to better performance and also enhances the firms’ access to outside capital. It is further explained corporate governance provides public policy objectives\(^1\). It ensures to eradicate the vulnerability of financial crises. It also helps to reduce the cost of capital and transaction cost. Corporate governance plays as a bridge between managers, shareholders, debt holders and stakeholders of the organization.

As per study corporate governance differs across countries and firms usually because of the institutional investors, shareholders, debt holders and managers\(^26\). Various countries have different economic backgrounds and various law enforcement practices. Furthermore, the level of law enforcement and accountability standards are also different from country to country.

According to another research, it is normally believed that the companies with better corporate governance disclose more information to the stakeholders and are more transparent due to greater monitoring\(^1\). Moreover, it is proposed that better-governed firms are more likely to be transparent, having more disclosure frequency, price discovery and more accurate analyst forecast.

It is also proposed a firm-level corporate governance is highly associated with the institutional framework and law enforcement around the jurisdiction of organization\(^26\), \(^27\), and \(^1\). A Study concluded countries with strong law enforcement practices provide more protection to the investors because they ensure good corporate structure which leads to encouraging corporate disclosure to the equity market as well as within the organization\(^21\). Firms have to abide by the rules and legislation in accordance with otherwise they would have been penalized. Thus we expect a higher standard of the disclosure which provides timeliness of information flows with increased efficiency followed by sound analyst forecast.

The development in mechanism of Corporate Governance: International report stated the financial crises of 1998 in Asia\(^7\), Russia and Brazil affected the whole economies and the deficiencies in corporate governance structure endangered the global financial system. Similarly, failure of corporate governance in the USA and Europe caused greatest insolencies in history. Therefore, in accordance with the aftermath of those events the corporate sector, economists and policymakers recognized the consequences of weak corporate governance.

By studying the corporate governance perspective from country to country the question arises whether a global framework of corporate governance is acceptable to all? The emergence of China, India, and Brazil as economic powers, the traditional corporate governance framework which is monitoring through active investors, managers, stakeholders, free financial media, and information disclosure is not necessarily that works. Why? Because corporate governance is about management decision making and certainly it is influenced by social norms, domestic culture, and overall structure, therefore, it varies from country to country. As per international report\(^7\), some of the various corporate governance frameworks presented across various countries to enhance the effectiveness of corporate governance structure which includes: “The company law in EU”, the latest “G20/OECD principles” (organization for economic cooperation and development).

Report shows following are the key emerging issue which boards need to address\(^7\):

- Greater attention for director independence
- Directors’ profile and their competency
- More stakeholders’ democracy as compare to shareholders’ democracy
- Better risk governance and risk management
- Compensation governance (for internal and external stakeholders)
Accountability of shareholders

Strategy formulation for value creation

Information technology/ IT Governance

Board performance evaluation procedures

Information disclosure (directors do not remain the last link in the chain.)

Independent boardroom

Corporate Governance and latest trends: Over the last two decades, governance issues are different from time to time. The Implosion of 2001-2002 was different from the financial global crises of 2008-2009. Therefore, the governance trends are likely to be shaped according to economic conditions.

It is reported that public companies would likely to face following trends by 2017:

- Increasing expectations toward the role of the board, to perform more oversight of the strategies and scenario planning and more investor engagement.
- Persistent focus on board composition with increasing directors’ knowledge proficiency, over boarding, directors’ skill enhancement methods and robust mechanism
- More scrutiny of company plans for sustained value creation plus to overcome the adverse effects of short-term priorities which compromise long-term interests.
- Greater focus towards environmental issues, the company operations must be environment-friendly and also provide alternate measures for waste management.

These trends are being explored by the in-depth analysis of key five major markets operations which include, USA, European Union, India, Japan, and Brazil.

Corporate Governance in Pakistan: The concept of corporate governance has root since the seventeenth century. The first recorded incident was back in 1609 between the investor “Isaac Le Maier” and the directors of “Dutch East India company”. Over the past five centuries, the concept has been evolved and become a pivotal factor by which firms are directed and controlled.

Since the inception of Pakistan in 1947, Pakistan is far behind in the economic developments and governance framework. In Pakistan, the “SECP” (Securities and Exchange Commission of Pakistan) first published corporate governance code in March 2002. That was the first step by the Government of Pakistan towards governance regime. Subsequently, all the Pakistani firms listed in stock exchanges of Pakistan incorporated by the code. Later on, in 2004 “SECP” established “Pakistan Institute of Corporate Governance” in the form of public-private partnership which is working to date.

These codes are in line with the best corporate governance practices in accordance with international standards. The major areas are a board of directors reforms to make them accountable towards stakeholders, better disclosure, transparency and better internal and external audits. It is further stated, the “SECP” believed that the only way to stimulate the interest of stakeholders is to ensure the governance policies must in line with the best ethical prevailing standards. The ethical standards prevailing in Pakistan are extracted from the Islamic jurisprudence which is obligatory by the constitution that all laws must conform to Islamic jurisprudence. The “SECP’s” fiduciary duties are based on “Anglo-American common law” and “Islamic laws.” Which show the significance of religion and culture in forming governance practices to be followed.

Another study reported corporate governance practices in Pakistan do not reward because of weak law enforcement and large extent of unethical practices. The concept of corporate governance since incepted in 2002 but it still scratching the surface. Due to lack of accountability and law abidance, the undocumented economy discourages the information disclosure and accountability towards the state and society. Various companies listed on Pakistan stock exchange are not practicing corporate governance.

As per The “SECP” has issued revised “Code of Corporate Governance 2012” which aims to overcome the deficiencies and to improve the overall corporate structure to meet the challenges currently faced by the Pakistani firms. Furthermore, Government of Pakistan in collaboration with “SECP” and other controlling wings formulating new policies and regulations to enforce good corporate governance regime.

LITERATURE REVIEW

The corporate governance is a mechanism through which organizations are directed and controlled.
According to another research corporate governance structure defines the rights and responsibilities of different participants within the organization which includes board of directors, shareholders, debtholders, managers, regulators and various stakeholders. Corporate governance is a process by which organization objectives are set and pursued in the context of market environment and regulatory framework. Governance mechanism consists of monitoring and regulating the actions, practices, and decisions of the organization.

Corporate governance mechanism consists of several elements. Transparency is one of the crucial element of corporate governance. Another Study stated transparency refers to the extent of firms' actions which are accessible within the market environment. Corporate transparency consists of local norms, privacy, business policies, operations, corporate decision making and corporate planning open to the shareholders, employees, stakeholders and the general public. Transparency plays an important role in the performance of an organization as not only it attracts the outside investors but also helps to build a strong corporate image. Corporate transparency consists of three dimensions, information disclosure, accuracy, and clarity. Transparency has become a crucial element in the success of an organization. Now a day, people are well aware of where to engage and where to spend. Therefore, corporate transparency provides a sound view of operations of the firm to the shareholders and the general public which leads to winning not only stakeholders interest but also attract outside investor towards the firm.

According to research disclosure refers to the communication of internal corporate information by people inside the firm to the outsiders. Normally, disclosure means the communication of firms' performance and governance to potential investors. Disclosure had different dimensions which include financial reporting which is essential for the organization to be disclosed as per set accounting standards. Furthermore, the reporting also empowers the stakeholders to be well aware of the firms' policies and their implementation and also held managers more accountable towards their responsibilities. According to a timely corporate disclosure helps the stakeholders for a better understanding of information regarding corporate decisions and implementation of corporate strategies. According to research disclosure can be functioned conversely for the growth of the firm. E.g. if a firm is engaged in greater research then it will lead to disclosing less information for proprietary cost reasons. Price discovery refers to the determination of the proper price of a commodity, security or good by the interaction of seller and buyer. Normally, in the corporate sector, price discovery refers to the determination of share price. According to the strong corporate governance is positively associated with price discovery in the Australian firms. The argument is in line with the fact that the strong corporate governance leads to timely disclosure which positively affects the price discovery of stocks. It is depicted in their research, timeliness refers to the characteristic of financial reporting to the agents of a firm to enable them to make a timely decision about an entity. Timeliness of information is a pivotal element of corporate governance. According to timeliness of information, either good news or bad news is subject to managerial discretion. This can be effective to accelerate the release speed of bad news just to reduce litigation cost and conversely reduce the release speed of good news for opportunistic reasons. Moreover demonstrated the good corporate governance leads to the better timeliness of information which leads to more disclosure in UK private firms.

In the capital market, financial analysts play an important role. They analyze information and determines the progress of the firms in terms of earnings. Corporate governance practices play a key role for forecast analyst. Firms with strong governance practices usually provide timely disclosure of information and are more transparent towards price discovery which aids the analyst to forecast future position of the firm. According to a research financial analysts provide an excellent avenue to test the quality of information regarding the capital market. The firms with good corporate governance mostly dependent on non-governmental resources and usually the signal better level of information and high transparency, therefore, analysts have more information to analyze and forecast future earnings.

According to corporate governance has a significant impact on firm's performance. Several studies have been conducted to find out the link between corporate governance mechanism and corporate performance. As per research the results demonstrated that corporate governance has a strong and positive impact over corporate performance.
Another Study also configured emergence of concentration of ownership comes with better results in performance5. A study reported nonlinear correlation between concentration and performance4, in global crunch (2008) period. A researcher studied positive relationship between independence of board and performance of organization23. A study found board diversity results moderation at firm’s performance25. It is discuss a very inoffensive part of managerial ownership with firm performance18.

In the presence of above mention literature, research following questions can be constructed.

1. Is ownership concentration impacts firm performance?
2. Is Corporate Governance Impacts firm performance?

**METHODOLOGY**

The population is contained of all non-financial organizations listed on Pakistan Stock Exchange and the Sample is PSX 100 index during the period of 2011 to 2016. Financial firms are precluded from the sample because of holding liquid assets due to different causes than Non-financial firms. Total 75 firms was selected out of 100 from different sectors in which 60 firms finally selected due to data availability restriction. So, total observations will be 360. Data is of secondary nature and collected from companies’ web sides and financial statements. Moreover it is also collected from SCS trade, Pakistan Stock Exchange, Dspace repository, KHI stocks and Share prices data is taken from Business Recorder website.

Theoretical framework of the study shows that it does has its roots in agency theory. OC, BI, BS, MO, BD and AR how impacts the Tobin’s Q and ROA. Following models can be illustrated.

**Fig. 1:** Depicts of relationship of corporate governance indicator and market based performance measure

Figure 1 shows the model with Tobins’ Q. Schematic model will be under analysis in further study.

**Fig. 2:** Shows the relationship of corporate governance indicators and accounting based performance measure
Figure two shows the model with Return on Asset. This is the second schematic model to conduct the analysis. When above model convert in the regression equation so following equations can be seen.

**OLS Regression:**

\[
\text{ROA} = \beta_0 + \beta_1 \text{OC}_t + \beta_2 \text{BS}_t + \beta_3 \text{BI}_t + \beta_4 \text{MO}_t + \beta_5 \text{BD}_t + \beta_6 \text{AR}_t + \beta_7 \text{FS}_t + \beta_8 \text{Lvg}_t + \mu_t \quad \ldots (1)
\]

\[
\text{TQ} = \beta_0 + \beta_1 \text{OC}_t + \beta_2 \text{BS}_t + \beta_3 \text{BI}_t + \beta_4 \text{MO}_t + \beta_5 \text{BD}_t + \beta_6 \text{AR}_t + \beta_7 \text{FS}_t + \beta_8 \text{Lvg}_t + \mu_t \quad \ldots (2)
\]

Here ROA represents Return on Asset, TQ represents Tobin’s Q, OC to ownership concentration, BS as board size, BI as board independence, MO as managerial ownership, BD as board diversity, FS as firm size, Lvg as leverage.

**DESCRIPTIVE STATISTICS**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Standard Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobin’s Q</td>
<td>360</td>
<td>10.24961</td>
<td>0.728056</td>
<td>7.669583</td>
<td>12.07519</td>
</tr>
<tr>
<td>Return on Asset</td>
<td>360</td>
<td>0.204386</td>
<td>0.498300</td>
<td>-0.080100</td>
<td>5.195155</td>
</tr>
<tr>
<td>Ownership Concentration</td>
<td>360</td>
<td>0.395800</td>
<td>0.254961</td>
<td>1.808736</td>
<td>96.5542</td>
</tr>
<tr>
<td>Managerial Ownership</td>
<td>360</td>
<td>0.150099</td>
<td>22.66518</td>
<td>0.000000</td>
<td>88.50290</td>
</tr>
<tr>
<td>Board Diversity</td>
<td>360</td>
<td>0.068452</td>
<td>0.893286</td>
<td>0.000000</td>
<td>0.500000</td>
</tr>
<tr>
<td>Auditors’ Reputation</td>
<td>360</td>
<td>0.706704</td>
<td>0.455910</td>
<td>0.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>Board independence</td>
<td>360</td>
<td>0.174369</td>
<td>0.164475</td>
<td>0.000000</td>
<td>0.777777</td>
</tr>
<tr>
<td>Board size</td>
<td>360</td>
<td>8.893855</td>
<td>2.037441</td>
<td>6.000000</td>
<td>15.00000</td>
</tr>
<tr>
<td>Leverage</td>
<td>360</td>
<td>0.161566</td>
<td>1.390084</td>
<td>7.393072</td>
<td>0.985311</td>
</tr>
<tr>
<td>Firm size</td>
<td>360</td>
<td>17.62114</td>
<td>2.042000</td>
<td>11.87940</td>
<td>24.65623</td>
</tr>
</tbody>
</table>

Descriptive statistics shows the data trend. It can be observe easily. That total number of observations are 360 and Tobin’s Q shows standard value 10.24 whereas SD 72% which means standard value can face difference up to 72% and minimum it can be 7.66 and maximum it can be 12.07. ROA of organization shows 0.20 mean value and it can face 49% alteration and minimum it can face -0.08 and maximum it can be 5.19. Ownership concentration can be changed 26%, Managerial ownership can experience 2266% change. Board diversity 89%, Auditor’ reputation 45%, Board independence 16%, Board size 203%, Leverage 139% and Firm size 204%. So, maximum variation can be observed in Managerial ownership and minimum variation board independence. It can be said BI is not that much different variable with respect to other variables.

Now the analysis run to interpret the results of the study. OLS regression run due to shortage of time and pooled regression is run to elicit few drawbacks related to time and entity.

**Table 2: Impact of ownership concentration and corporate governance on Tobin’s Q**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symbol</th>
<th>Coefficient</th>
<th>Std.Error</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Concentration</td>
<td>OC</td>
<td>-0.088881</td>
<td>0.102272</td>
<td>0.013854</td>
</tr>
<tr>
<td>Managerial Ownership</td>
<td>MO</td>
<td>0.3854</td>
<td>-0.003557</td>
<td>0.001283</td>
</tr>
<tr>
<td>Board Diversity</td>
<td>BD</td>
<td>-0.084528</td>
<td>0.032760</td>
<td>0.0101</td>
</tr>
<tr>
<td>Auditors’ Reputation</td>
<td>AR</td>
<td>0.489367</td>
<td>0.063168</td>
<td>0.0000</td>
</tr>
<tr>
<td>Board independence</td>
<td>BI</td>
<td>0.316212</td>
<td>0.138561</td>
<td>0.0231</td>
</tr>
<tr>
<td>Board size</td>
<td>BS</td>
<td>0.020621</td>
<td>0.010870</td>
<td>0.0665</td>
</tr>
<tr>
<td>Leverage</td>
<td>Lvg</td>
<td>-0.000195</td>
<td>0.000235</td>
<td>0.4073</td>
</tr>
<tr>
<td>Firm size</td>
<td>FS</td>
<td>0.111343</td>
<td>0.012223</td>
<td>0.0000</td>
</tr>
</tbody>
</table>
Above table show that Tobin’s Q is effected by OC at 5% level of significance and it effects (-0.088). Whereas MO shows significance at 1% level of significance and adhere (+0.38) effect at Tobin’s Q. it mean one unit change in MO will change Tobin’s Q 0.38 times. BD shows (-0.08) and significant at 5% level of significance. AR (+0.48) at 1%, BI (+0.316) at 5%, BS (+0.02) at 10%, and FS (+0.11) at 1% level of significance. Standard errors are less than co efficient this shows data is normal and there is no Multicollinearity in data.

### Table 3: Impact of Ownership Concentration and Corporate Governance on ROA

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symbol</th>
<th>Coefficient</th>
<th>Std.Error</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Concentration</td>
<td>OC</td>
<td>0.113437</td>
<td>0.012223</td>
<td>0.0000</td>
</tr>
<tr>
<td>Managerial Ownership</td>
<td>MO</td>
<td>0.307999</td>
<td>0.076497</td>
<td>0.0001</td>
</tr>
<tr>
<td>Board Diversity</td>
<td>BD</td>
<td>4.045583</td>
<td>1.598991</td>
<td>0.0118</td>
</tr>
<tr>
<td>Auditors’ Reputation</td>
<td>AR</td>
<td>12.14599</td>
<td>3.480181</td>
<td>0.0005</td>
</tr>
<tr>
<td>Board Independence</td>
<td>BI</td>
<td>3.207785</td>
<td>8.467566</td>
<td>0.7050</td>
</tr>
<tr>
<td>Board size</td>
<td>BS</td>
<td>-2.121342</td>
<td>0.734626</td>
<td>0.0041</td>
</tr>
<tr>
<td>Leverage</td>
<td>Lvg</td>
<td>0.004805</td>
<td>0.010985</td>
<td>0.6621</td>
</tr>
<tr>
<td>Firm size</td>
<td>FS</td>
<td>-1.781703</td>
<td>0.716155</td>
<td>0.0133</td>
</tr>
</tbody>
</table>

This model shows that OC (=0.11), MO (+0.30) are significant at 1% level of significance. BD (+4.04) at 5% level of significance, AR (12.1) at 1% level of significance, BI (+3.20) shows insignificant relationship with ROA which shows that there is no impact of BR on firm performance measured on the basis of ROA. BS (-2.12) significant at 1% while it shows negative relationship with ROA. LEV (+0.0448) shows insignificant relationship with ROA while firm size shows significant relation at 1% with a negative relation with firms performance measured with ROA.

### CONCLUSION

This imputes of the study to ascertain the impact of ownership concentration and corporate governance on firms’ financial performance. The construct of the study depends on the two major hypothesis. To scrutinize data is gathered from 60 firms listed on Pakistan Stock Exchange. Data was analyzed using Balanced Panel Method. Six indicators are used to measure corporate governance, while ownership concentration is measured through largest shareholder of the firms. Two different models are developed to measure the results based on the dependent variables. The results of the study indicates that owner concentration has negative impact on firm performance measure on market based analysis while positive impact on firms performance measured on the basis of ROA which indicates that higher the performance and investment leads to higher firms concentration while the results in tobin’s Q shows inverse relation as its negatively related to each other. While components of corporate governance shows significant effect of firm performance. However, firm leverage show negative relation with ROA. Broad independence shows no impact on firm performance measured on the basis of ROA while on tobins’ Q measures results shows broad size has no impact on firm performance measured on market based analysis.

### RECOMMENDATIONS & SUGGESTIONS

- This study provides useful information in increasing understanding on the relationship between ownership concentrations, corporate governance firm performance.
- The study also discloses that policymakers, regulators, owners and stakeholders should focus more on effectiveness and efficiency of respective board members rather than number. The results have implications for regulatory authorities, directors and shareholders to take steps to enhance the board and ownership structure for better performance.
- In comparison of developed countries, non-developed markets lack the strict implementation of corporate governance codes.
In Pakistani scenario implantation of corporate governance codes is not good due to family businesses and exists conflicts between SECPs’ drawn corporate governance codes and already established procedures.

There should be strict implementation of corporate governance codes so that performance could enhance.

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**Ethical Clearance:** IJRISE Journal Reviewer Committee

**REFERENCES**


STO be a Dancer: Professional Choice and Politics of Gender in Mahesh Dattani’s Dance Like a Man

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ABSTRACT

The present paper attempts to explore the emergence of Feminine Man in Indian English Theatre as a new site of gender politics. Society understands gender on the basis of the performance of manners and behaviors of men and women in a cultural background. Most of the critics believe that sex is biological and gender is a social construction. From the inception of civilization, every age has its particular ideology of being a man. In modern times, masculinity is broadly defined by social structure. Feminine Man is the product of this modern masculinity. Contemporary Indian Theatre in English is a fertile area of revealing this ‘invisible’ issue of gender identity. In Mahesh Dattani’s play Dance like a Man Jairaj Parekh, the protagonist of the new age theatre of India, portrays and highlights this trend of Feminine Man, which is directly or indirectly predisposed by social circumstances.

Keywords: Feminine Man, Gender politics, Culture, Ideology, Masculinity, New age.

INTRODUCTION

Study on gender is a topic of debate as it focuses on social equality or emancipation of will, even in physical power. Perhaps, the consciousness about gender comes from the realization of the fact that the men are dissimilar to women. Existing theories on gender, however, reflect on sex as a social category too, for the human biological body itself is considered as the site where the socio-political perceptions of the viewer are mapped on. Thus, society constructs roles for each of the genders and one particular gender is made to conform to its given role, failing which they are accountable to be stigmatized. Gender roles are internalized in such ways as not to make the individual think objectified, but to accept that one emerges as a subject only in compliance to them. Feminist theory, therefore, asserts that gender is an ideology because it takes for granted what are socially accepted and it thus proposes and reinforces the differences in gender performances in society as natural, predetermined, and unchangeable. But in conformity with the deconstructive view, the postmodern thinkers consider that gender is not a rigid or constant category across the world. Gender, like a text, appears to be a performance, the playing out of different roles, that has to be repetitive and confirmed within definite social and cultural conditions, but which is also open to challenge and compromise. Thus, the postmodern views of gender seem to be basically anti-essentialist. The postmodern theories of gender even question the ideas of legitimacy, universality, authority, and objectivity. From this point of view, texts such as Mahesh Dattani’s Dance like a Man dismantle the firm adherence to gender roles in the traditional social structure which creates an acidic relation between a father and a son and destroys an artist of blameless passion for his dance.

With the emergence of modernity, individual choices differ from stereotypical social structure. The idea of socially assigned gender role is dismantled in contemporary culture. Throughout one’s life span, an individual experiences different way of socialization in a
certain socio-cultural condition. An individual gets social environment from family, school, friends, etc. It helps the individual to acquire social identity, catered by relatives, guides and friends. In Dattani’s *Dance like a Man* Jairaj performs the role of a Bharatnatyam dancer under the guidance of his guru. Dancing, a performative art in Indian society is generally accepted as the profession of the women. Thus, the performance of dancing contributes to the formation of non-conformative gender role of Jairaj in the society.

In this context, it is crucial to note that Mahesh Dattani highlights how the patriarchal society and the idiosyncrasy of individuals are closely related to each other. His play *Dance like a Man* shows that professional choice of a man is generally determined by dominant culture of the society. The patriarchal society opposes the personal choice of career opted by the protagonist, Jairaj. The play reveals that a man is supposed to do the work which suits a man and not pursue their career in anything else which makes them less of a man. A man deviated from the gender specific roles assigned by the society is being sidelined by the people and the society. The dramatist gives a twist to the stereotypes associated with ‘gender’ issues that view solely a woman at the receiving end of the oppressive power structures of the society.

**LITERATURE REVIEW**

Literature review generally attempts to focus on the areas where related studies had been done before and certain parts missed by them. There have been several interesting studies on professional choice as a site of gender politics. These earlier studies show that profession is a major factor in the process of socialization and stereotypical gender identity formation.

C.K.Meena while unmasking the middle class society in Dattani’s plays observes that Dattani’s works reveal a recurring theme of gender identity.

Anjelie Multani discusses the politics of production and performance in Mahesh Dattani’s play *Dance like a Man* to assert that Jairaj’s passion for Bharatnatyam goes unappreciated, cruelly trampled upon by his own father for stereotypical gender construction.

Neha Mehta points out that the story of *Dance like a Man* explores the dynamics of a family in which a ‘pathetic’ man enters a ‘woman’s world’ and steadfastly sticks to it.

Claude Dubar shows that identity forms are constructed and/or reconstructed through socialization processes that individuals establish in the family and work processes.

Beemyn and Rankin focus on discrimination against non-conforming transgender identities.

In the article by Beena Agrawal, “Dynamics of Human Relationship in Mahesh Dattani’s Tara” is an investigation into the cause-and-effect pattern in the relationship between Tara and Chandan. In this context, she emphasizes the “… realization of the identity of distinctive selves working in union in the comprehensive scheme of things.”

Asha Kuthari Chaudhari in her article “Numbness is all: Thirty Days in September” discerningly comments: “Child sexual abuse spans a range of problems, but it is this complicity of the family through silence and a lack of protest that it is the ultimate betrayal for the abused.

This paper endeavors to explain how dance as a performative art facilitates the construction of non-conforming gender identity for a man. There is currently insufficient study that is pertinent to disclose the gender non-conforming identities among men in patriarchal society. Reflecting on this ‘invisible’ site of masculinity, the present reading focuses on the socio-cultural process of construction of a dancer’s (Jairaj) identity by concentrating on relevant areas of gender studies. Taking cue from Judith Butler’s germinal notion of gender performativity, *Dance like a Man*, a play by Mahesh Dattani is critically examined within the framework of socio-cultural context.

**PROFESSION AND CONSTRUCTION OF GENDER IDENTITY**

With the advancement of Feminist movement, sexuality attracts the central issue of the debate: whether it is innate or socially formed. Sexuality depends on biology or preference principle. But gender is a specified attribute to various sexes. Before considering gender as a social construct or not, it is necessary to make out the basic concept of social construction and how it shapes the gender studies. Social construction is regarded as one of the elementary ideologies of social studies. It
refers to the meaning which is produced through action, feedback or communication of human beings. It is based on shared views of various human requirements such as language, habits, symbols, color, etc. Thus, social construction is not natural and inborn as it is revealed, not even stable; rather it is created by human beings. It can be altered and reshaped, which varies with time and place. Therefore, social environment plays the role to form identity.

Judith Butler10 through her germinal notion of gender performativity in *Gender Trouble* highlighted a fertile area in feminism by focusing on the variability of gender role. Butler asserted that gender binaries were social constructs. To challenge the gender norms through performance is to refute the roles socially attached to a particular sexual category. In this process, mutually opposite gender types could be destabilized, and a various possible gender ‘positions’ would be constructed. To understand the idea of gender culturally, it is necessary to explore the means of actions and attitudes of men and women in a society. Sexuality is shaped by socio-political aim and connected with authority around color, race, class, and chiefly gender11. From the anthropological perspective, one can assert that each era has its established ideology of being a man from the inception of the civilization. Today, masculinity is generally confirmed by social makeup. It is regarded as the dominating part of gendered society symbolizing male supremacy. But what noteworthy here is to point out whether the authoritative person is a womanly self of the male. Jairaj by performing the passive role after infiltration reveals that gender is a socially fashioned identity.

Feminist critiques of the literature of professionalism emphasize that professionalism has too often been modeled on preexisting masculinized institutional structures. In the present study, in spite of family problems, personal interest and artistic expectations about dance are important for career choice. Dancing as a profession is socially recognized performance and it is generally accepted as women’s work. Thus, the career of dancing by a man questions the hegemony of the dancing profession and undermines the idea of masculinity through the construction of non-conformative gender identity12. Professional choices represent a landmark in the construction of one’s identity and exclusion from stereotypical gender role.

**MASCUlINITY AND FEMININE MAN**

In present time, the concept of masculinity13 and its contemporary approach to Feminine Man can be regarded as a primary concern of our discussion. Generally speaking, masculinity is the contradictory or the counter element of femininity. But a critical analysis of masculinity shows a dissimilar account altogether. It is not actually the opposite part of femininity; rather a socially constructed type of behavior, manners, representation depending upon the biological attributes. The concept of manhood is not something with which one is born but one attains it after birth through the process of socialization.

Gender identities are formed from birth as children are shaped into socially-approved patterns of masculininity and femininity. But, while early childhood is undoubtedly a crucial period in the formation of gender identities, masculinities14 and femininities are being created and recreated throughout the lifecycle: confirmed, negotiated and modified on a daily basis15.

Masculinity, therefore, can be seen as a concept like Feminism and it deals with the position of men in a particular society. It probes into the power relation of masculinity in a given socio-political and cultural context15. The study of masculinity is often connected with women, gay, transgender16, 17, etc. Masculinity study is a novel ground of study which came into sight in 1970. It emerged in the field of criticism to indicate men’s right in society. But the feminine man is to some extent different from this conventional representation and belief of man. History of civilization shows that every age has its particular ideology of being a man. Masculinity in 3000 B.C. was recognized by the valor and audacity; medieval masculinity was basically based on Christianity and gallantry; Victorian masculine ideology was identified with good, responsible, familial, and protective male of the family; Masculinity in the modern age is mostly characterized by social structure. Feminine Man is the result of this modern masculinity. There is no exact history to map out the Feminine Man, but it can be assumed that after World War II, when there was no absolute man in the western society and women took the position of working men there was a feasible reason for the emergence of Feminine Man. Feminine Man is totally different from the traditional man. Masculinity used to be the symbol of activity, just exactly the opposite of femininity18. Women in that context considered themselves as passive, inferior, weak, and less powerful. But the view of the world towards the men and women
started changing only after the awareness of the fact that women could be self-sufficient through their work. Therefore, the concept of the Feminine Man has been stimulated after the Feminist movement in 1980s, when women started to voice for equal rights. Masculinity is highly questioned by the Feminist movement. Like women, Feminine Man is more perceptive and poignant. Feminine Man challenges traditional definitions of masculinity and embraces individual performance to form a new role of man in society. Moreover, this new man articulates his inner urges with emotion which the patriarchal society cannot easily accept. The ‘New’ man voluntarily chooses without shame the qualities that have socio-culturally been defined as ‘feminine’, while still fighting against the discrimination on ‘feminine’ men. He is not hostile and most often he performs from his pursuit like any woman does. Today, the aggressive man is not only suitable as masculine symbol but ‘feminine’ man has emerged as a self-identified category of masculinity.

The play Dance like a Man flips open in the opposite gender’s point of view and shows that even men can be a part or a victim to such circumstances by being oppressed and suppressed by the opposite gender and society. Jairaj and Ratna have to live within the domain of the ‘patriarchal’ Amritlal, father of Jairaj. Amritlal considers dance as a career of public women and that’s why he cannot allow his daughter-in-law practicing it. He never imagines that his son may learn it and make it his choice for profession. Amritlal is so-called honorable person in the society as he is a reformist. He fears that people would chuckle at him for Jairaj’s performances and his reputation would be destroyed. Jairaj’s father cannot endure performing dance before his eyes and his son wandering with the ornaments in his leg during the practice hours. His father also blames the effeminate dancing guide who visits their house his leg during the practice hours. His father also blames the effeminate dancing guide who visits their house.

**JAIRAJ AS A FEMININE MAN**

Mahesh Dattani is the world-famous playwright from India writing in English who depicts the ‘invisible’ issue of gender politics to reshape the conventional idea of masculinity by skillfully dramatizing the innovative theme of gender discrimination on men in his play Dance like a Man. The dramatic narrative of the play evolves round the story of individual’s struggle against the society. Gender discrimination is institutionalized by refusing individual choices, self-development and self-identity. Dattani admits:

I wrote this play when I was learning Bharatanatyam in my mid twenties... a play about a young man wanting to be a dancer, growing up in a world that believes dance is for women.

The character of Jairaj is the mouthpiece of new men in this play. It is a coming of age play, published in 1989. It can be considered as one of the most appreciated dramas in the history Indian theatre. The circumstances and conditions which have been highlighted in this play are different. Dattani’s plays deal with the contemporary life experiences of middle and lower middle class families where family relationship plays a crucial role to highlight the gender discrimination on both men and women. Family takes the central part and incorporates other parts so as to form a whole, that is, the society. Thus the family acts as a lens to capture the larger whole. At the same time, Dattani digs into its bleaker sides by exploring the patriarchal foundation of the society that has often refuses individual choices of family members. Under the mask of conflict between tradition and modernity, Dattani dares to show unconventional and new aspect of gender politics in this play. Individual performance not conforming to patriarchal society creates predicament for the modern man and it is expressed competently in his present drama. Neha Mehta writes:

...the story explores the dynamics of a family in which a ‘pathetic’ man enters a ‘woman’s world’ and steadfastly sticks to it.

Although socially regarded as a man of liberal ideology and progressive views, Amritlal Parekh, the repressive father in Dance like a Man, verifies the attitudes and manners of his son Jairaj. Jairaj is a Bharatanatyam dancer. The play is an account of familial conflict which begins with Jairaj and Ratna in their old age, memorizing their days of resistance in retrospect, and in the 1950s when there was a social disgrace added to the Bharatanatyam. It is a dance of public women, and members of decent families don’t follow this form. So it is twice difficult for a man to practice a profession in such a bodily dance as it has categorically been limited.
to women. Jairaj, therefore, questions the idea of dance being a feminine art, and emphasizes that it is about absolute artistry and a female safety-valve. Amritlal appears in the play as a preserver of fixed gender roles. He appears as the father whose power finds expression only in controlling the son’s free will at the pretext of caring for him:

Amritlal: I have always allowed you to do what you have wanted to do. But there comes a time when you have to do what is expected of you. Why must you dance?  

Amritlal is proud of his assignment to eliminate the evil practice of divine prostitution which he believes to be a ‘shame’ to the society. But the truth underlying his oratory is that he is more hostile to those wretched women than involved in revealing the core reason of the flesh trade. The humanitarian mission of Amritlal results in imposing the intentional ideals upon them, and thereby, denying expression to their own desires. Jairaj, caught in the complex system of fixed gender roles, tries earnestly to express his inner feelings through dance. He embraces dance which is supposed to be shameful and feminine practice in the eye of society. He searches for freedom that an artist craves for and discovers in her/his art. What it brings about is that Amritlal identifies dance as a prostitute’s art, which to Jairaj is a talent practiced in holy place having divine aspects.

The play reflects on the hidden site of masculinity. Dattani here presents Jairaj as less masculine than the conventional men by brilliantly questioning the social boundaries for the works of men and women, the gender stereotypes, the gender roles, and the ‘invisible’ problematic in social formation of gender under the clothing of a fine family conflict. Amritlal, one of the representatives of patriarchal belief, argues for fixed gender roles. That’s why to him, playing cricket rather than dancing would be an expression of masculinity. The boundaries of gender and body are lightly sited.

The performances of the body confirm the gender of the individual. Body may harmonize the performance of an art, but when it is internalized in such ways as to recur it in terms of expression, socio-cultural norm can be put to question. Amritlal finds enough space to argue against the ‘normalcy’ of Jairaj. The truth therefore exists in a twin structure, one is that which is outside the domain of art, and the other is in the art itself where it is being shaped and reshaped in terms of their demands. But it is an eye-opening fact that in every reconstruction there stays a referent in the world outside, so that there can be a communication between the two.

The father in Dance like a Man appears not just as a single individual, but as a symbol of patriarchal figure having the ‘phallus’, embodying authority and the only initiator of meaning. Jairaj is the new man who lives in the apprehension of castration, not for the aspiration of his mother but his dance. He appears as a site on which the meaning is imposed upon, so as to continue bearing the already constructed. In the play, Jairaj once became courageous to leave the house on his own, but after facing problems he returned to his father’s house and surrenders his self-esteem to him. To match his son’s self-expression to his own gender, Amritlal tries to maneuver Ratna in doubting Jairaj’s ‘manliness’. Amritlal plots with her for making Jairaj a ‘manly man’ instead of a ‘feminine’ man. Jairaj is willing to practice dance but his father is strongly critical of Jairaj’s point of view because the conventional socio-political structure of our society does not permit a man to take dance as his occupation and hates dance to be for a lower class of women. Amritlal tries to restrict Jairaj from dancing and says:

A woman in man’s world is considered progressive, but a man in a woman’s world is considered pathetic.

Amritlal, despite being a social reformer, weaves a plan against Jairaj to exert control over his passion of being a dancer and to help him being a ‘manly man’. It skillfully points out that Jairaj possesses the characteristics of ‘feminine’ man against which Amritlal continuously attacks. Jairaj challenges the traditional view of masculinity and opens up concealed issue of gender politics through the portrayal of patriarchal discrimination against the free choice of expression gender roles.

Thus the present study shows that the construction of gender role is based on the behavioral patterns and expressions of men and women in a socio-cultural set up. Patriarchal society has its particular ideology of being a man. In this context, masculinity is mostly determined by social structure. It appears to be the superior part of society which absorbs the opposite gender through its male power. But when the male part becomes the infiltrated person, that person is identified as a feminine self of the male. Jairaj dismantles the idea of masculinity by performing dance which is considered to be women’s work in patriarchal society of India.
Dattani skillfully uses the conventional form of dance as a means to expose the politics of gender in the play *Dance like a Man*. Professional choice of an individual becomes a debatable site of gender identity and thus deconstructs the patriarchal system of gender binaries. Amritlal would never admit his son choosing the career of a dancer, Ratna misled him, Jairaj was charged as a person lacking manhood and the ability to earn and support his family. The socio-cultural atmosphere in the play leads to the conditions that reveal how gender politics works in the Indian society. The play makes one think and rethink about how our actions are shaped according to the society and how one has to accept them without questioning. The textual analysis with the help of post-feminist outlook justifies the purpose of the hitherto discussed topic. His plays transcend the limits of space and time as they project the crucial issues of growth of changing gender roles in society. In this way, Dattani will be relevant through the ages.

**CONCLUSION**

Dramatic text is a literary output of a dramatist represented through theatrical performances. Technically, theatre is designed to perform and to expose the conventional social norms in a given cultural condition. It is used to focus on patriarchal plot against the individual choice prevalent in a society. Hence, a dramatic text can be analyzed critically from the perspective of gender studies in general and masculinity studies in particular. Dramatic texts are the mirror of society, they do not just capture the reality underlying beneath the socially constructed norms; rather they act as vehicles to voice against social oppression on individual gender roles. The obvious question is: do the theatrical texts throughout the world play the role of a significant mode of representation? There are diverse reasons for the popularity of drama but the most acceptable reason is its suitability in almost all the spheres of society. Material life is full of pains and agonies. The problem is sometimes the output of some individual or sometimes the social background which is directly or indirectly controlled by socio-cultural scenario. There are certain things in social life like politics, religion, beliefs, culture, tradition, etc. which thwart free choice of gender roles. Therefore, it is worthy to sum up that the new trend in Indian English Theatre goes with the change of the society. Mahesh Dattani, particularly through his play *Dance like a Man*, lays bare the challenging but promising issue of gender politics. He introduces himself as the ‘change element’ in the contemporary structure of Indian English Theatre. It is not only about Jairaj but also an entire shift of protagonists in terms of their attitudes and manners. They do not hold a strict aggressiveness; they do not want to act like that. They disregard the fixed masculine attitude and form a totally new self-defined personality of masculine stance, which can simply be attached to feminine outlook. *Dance like a Man* has projected this image of ‘feminine’ man, and mapped out the spirit of the socio-cultural situation.

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**Source of Funding:** Self

**Ethical Clearance:** IJRISE Journal Reviewer Committee

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Increase Phishing Tweets Detection Accuracy with Improved Classification Features

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Abstract

Phishing used to be well-known as a form of Social Engineering crime that deceives victims by directing them to a fake website where their confidential and sensitive information are gathered for unlawful activities. Traditionally, Phishing attacks targeted email users but have now exposed to target users at Online Social Networks (OSN)s such as Twitter, Facebook, Myspace, etc. Since OSNs have become so prevalent to Phishers to spread Phishing attacks, a research study to increase the Phishing tweets detection accuracy by improving the classification features tested on a dataset containing Phishing and safe Uniform Resource Locators (URL)s collected from Twitter is required. In this study, machine learning of Random Forest (RF) claimed to achieve high detection accuracy by other researchers and number of different classification features were used to test on a dataset collected from Twitter. The results of our experiment showed that we managed to identify 9 best classification features with higher achieved detection accuracy of 94.69% than 94.56% achieved by other researchers who using more than 9 features tested on the same dataset collected from Twitter.

Keywords: phishing, twitter, random forest, classification features

Introduction

Social Engineering is an art of getting users to compromise information systems¹ and a real challenge to us today. In addition, it can also be regarded as “people hacking”² and referred to information systems penetration through the use of social methods. Both individuals and organizations suffered enormous losses from these Social Engineering attacks.³ The main factor of challenging risks to individuals are personal data and organizations are customer data. Individuals are more vulnerable to Social Engineering attacks because they do not expect and know they are victims of such attacks.⁴ A Social Engineering attack often success depending on the target either being willing or tricked into sharing personal information.⁵ Therefore, extra vigilant of Social Engineering has to be seized all times. There are 2 types of Social Engineering approaches - Computer (Technology) based and Human (Non-technology) based.⁶,⁷,⁸

Phishing is a Computer (Technology) based Social Engineering attack; and an effort for retrieving people critical information.⁹ It is also well-known as a form of Social Engineering crime called semantic attack and online identity theft that deceives victims by directing them to a fake website appears legitimate.¹⁰,¹¹,¹² Phishing is a cyber-threat first identified in 1996.¹³

Phishing attacks target email which serves as the primary vector traditionally¹⁴ have now exposed into popularity of OSNs. According to APWG¹⁵ survey report, OSNs have become significant platforms where Phishers launching Phishing attacks. In addition, Threat Summary¹⁶ cited that the fraudulent accounts across social channels doubled from Q3 to Q4 in their Q4 2016 report. Such fraudulent accounts may be used for Phishing, social spam, malware distribution, and more. Based on the reviewed reports, it implied that OSNs still remained the popular platforms Phishers used to launch Phishing attacks currently. Twitter is a form of OSNs and an immensely popular micro-blogging network where people post short messages of 140 characters called tweets,¹⁷,¹⁸,¹⁹,²⁰ and a critical source for real-time information sharing and news dissemination.²¹ It has been used by Phishers as a medium to spread Phishing today due to its vast information dissemination and difficult to be detected unlike email because of its fast spread in the network, short content size and short URL.¹⁸,²⁰ Twitter is unlike other OSNs such as Facebook or Myspace because its relationship of following and being followed do not require reciprocation.²² As such, it becomes so popular used by people. In view of its popularity of
use, it always focuses by malicious users who often try to find a way to attack.\textsuperscript{19} There are many researchers adopting machine learning techniques to detect Phishing tweets on Twitter in the past; but the number of features used by them in their machine learning classification can be considered high and be improved further. Therefore, a research study to improve the classification features with the purpose of increasing the Phishing detection accuracy to test on a dataset containing Phishing and safe URLs collected from Twitter is deem required.

The objective of this study is to explore whether there is any possibility to improve classification features by reducing the number of features used and to increase the Phishing tweets detection accuracy with RF. In this particular context, 94.56% accuracy achieved by Sharma et al\textsuperscript{23(p215)} was selected as the improvement target since the same dataset collected from Twitter was used in our experiment.

This paper proceeds with the literature study that discussing some related works done in the past and methodology that detailing out the entire work activities conducted. The section followed by the discussion on our findings with respect to the objective of the study and ended with a conclusion.

**LITERATURE STUDY**

Some related works pertaining to machine learning classification features in the past were studied and conducted before initiating our experiment.

In McCord and Chuah,\textsuperscript{17} user based and content based features were selected and used in machine learning classification. The user based features basically referred to the user’s relationships such as follower and followee or user behaviors, and content based features referred to the average length of a tweet, number of URLs, replies or mentions, keywords or wordweight, retweets or tweetlen and hashtags.

As for Sharma et al,\textsuperscript{23(p215)} they used 6 sets of features containing URL based, tweet based, WHOIS based, user based and network based features in their machine learning classification experiment. According to them, the classification started with 1 set of features followed by adding on another set of features in the next classification activity until the total 6 sets of features were used completely. From the experiment, they concluded that the Phishing detection performance improved significantly when more sets of features typically the tweet based features were added in the classification.

Basnet et al\textsuperscript{24(p11)} grouped features into lexical based, keyword based, search engine based and reputation based. As pointed out by them, every each of the groups contains number of features in which they used 138 features in their experiment.

In Sananse and Sarode,\textsuperscript{25} 24 lexical based, 48 WHOIS based, pagerank based, Alexa rank based and many PhishTank based features were selected and used in the experiment.

Another experiment conducted by Akanbi et al\textsuperscript{26(p85)} indicating that they managed to yield high detection accuracy with only 9 selected features of Long URL, Dots, IP-address, SSL connection, At “@” symbol, Hexadecimal, Frame, Redirect and Submit.

Arising from the entire literature study, it was noted that the 9 selected features used by Akanbi et al\textsuperscript{26(p85)} could be effective machine learning classification features as they allowed them to yield high detection accuracy using less features compared to other researchers discussed earlier, which may be possible to be explored further in our experiment.

**METHODOLOGY**

The entire process of this study was divided into 3 areas. They are selection of dataset, machine learning technique and classification features. Fig. 1 shows the entire components used.

**Dataset Selection:** We adopted a supervised machine learning approach where a set of labelled data containing 1573 URLs labelled as Phishing and 1400 URLs labelled as safe collected from Twitter provided by Sharma et al\textsuperscript{23(p215)} was selected and used.

**Machine Learning Technique Selection:** RF was selected and used as it was claimed by Sharma et al\textsuperscript{23(p215)} the best machine learning technique that allowed them to achieve high detection accuracy of 94.56% in their experiment.

**Classification Features Selection:** Classification feature sets used by McCord and Chuah,\textsuperscript{17} Sharma et al,\textsuperscript{23(p215)} Basnet et al,\textsuperscript{24(p11)} Sananse and Sarode\textsuperscript{25} and Akanbi et al\textsuperscript{26(p85)} were selected and used as the basis of features to be explored for determining the best classification features.
In this study, we used Standard Information Retrieval Metrics viz. Accuracy, Precision and Recall to evaluate the effectiveness of the classification and a Confusion Matrix (Table 1) to explain further on the experiment.

**Table 1: Confusion Matrix**

<table>
<thead>
<tr>
<th>ACTUAL</th>
<th>PREDICTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phishing</td>
<td>Safe</td>
</tr>
<tr>
<td>Safe</td>
<td>TN</td>
</tr>
<tr>
<td>Phishing</td>
<td>TP</td>
</tr>
<tr>
<td>Safe</td>
<td>FN</td>
</tr>
<tr>
<td>Phishing</td>
<td>FP</td>
</tr>
</tbody>
</table>

Where TP - True Positive,
FP - False Positive,
TN - True Negative,
FN - False Negative

Accuracy = \(\frac{(TP + TN)}{(TP + FP + TN + FN)}\)

Precision (Phishing) = \(\frac{TP}{(TP + FP)}\)

Recall (Phishing) = \(\frac{TP}{(TP + FN)}\)

In addition, Weka tool to assess the RF and cross validation of 10 folds test mode were used. The 10 folds test mode was selected because the data available was limited to 2973 and to ensure all the available data are able to be used to train the classification model and to compare on the test set in a particular division respectively.

The result of the classification from the RF was saved in a model and used for subsequent testing. 2 new testing datasets containing Phishing and safe URLs of 1500 and 3000 respectively were used for prediction testing using the earlier saved model. These 2 datasets were extracted from a URLs dataset where its data were collected from the source of PhishTank, Google Search with McAFee WebAdvisor, Google Safe Browsing and Web of Trust (MyWOT). Fig. 2 shows the process flow of URLs dataset compilation.

**FINDINGS AND DISCUSSIONS**

From the experiment, 9 features were identified as the best classification features because the accuracy we achieved with such 9 identified classification features was higher than what achieved by Sharma et al 23(p215) who using more than 9 features tested on the same dataset collected from Twitter.23 8 best classification features were suggested by the WEKA tool under Attribute Evaluator as “CfsSubsetEval” and Search Method as “BestFirst” as the most relevant features, and the remaining 1 was selected from 21 features gathered from the set pool used by McCord and Chuah,17 Sharma et al,23(p215) Basnet et al,24(p11) Sananse and Sarode25 and Akanbi et al 26(p85) based on manual evaluation assessment according to the typical feature selection method.27, 28, 29 Table 2 lists the 9 best classification features.

**Table 2: 9 best classification features**

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature</th>
<th>Suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>URL length (F1)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>2.</td>
<td>SSL connection (F2)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>3.</td>
<td>Hexadecimal (F3)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>4.</td>
<td>Google pagerank (F4)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>5.</td>
<td>Alexa rank (F5)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>6.</td>
<td>Age of domain-Year (F6)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>7.</td>
<td>Digit in host (F7)</td>
<td>WEKA tool</td>
</tr>
<tr>
<td>8.</td>
<td>Host length (F8)</td>
<td>Evaluation assessment</td>
</tr>
<tr>
<td>9.</td>
<td>Registrar (F9)</td>
<td>WEKA tool</td>
</tr>
</tbody>
</table>

Table 3 shows the classification results of accuracy achieved by RF using the 9 best classification features.
Table 3: Classification results of accuracy achieved by RF using the 9 best classification features

<table>
<thead>
<tr>
<th>No.</th>
<th>Features</th>
<th>No. of Features</th>
<th>RF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>F1 + F2 + F3 + F4 + F5 + F6 + F7 + F9</td>
<td>8</td>
<td>93.98%</td>
</tr>
<tr>
<td>2.</td>
<td>F1 + F2 + F3 + F4 + F5 + F6 + F7 + F8 + F9</td>
<td>9</td>
<td>94.69%</td>
</tr>
</tbody>
</table>

1500 URLs as Phishing and 1315 URLs as safe were predicted correctly by RF. As such, this contributed to the achieved accuracy of 94.69% for the entire classification process. As for the precision and recall for Phishing, RF achieved 94.64% and 95.36% respectively. The following Confusion Matrix (Table 4) shows the RF achievement using the 9 best classification features.

Table 4: RF achievement using the 9 best classification features

<table>
<thead>
<tr>
<th>ACTUAL</th>
<th>PREDICTED</th>
<th>Predicted</th>
<th>Phishing</th>
<th>Safe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phishing</td>
<td>1500</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe</td>
<td>85</td>
<td>1315</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The accuracy achieved using the model derived from RF and the 9 best classification features tested on the 2 new testing datasets containing 1500 and 3000 URLs were 94.27% and 94.13% respectively. Table 5 summarises the accuracy achieved for the training dataset and the 2 new testing datasets.

Table 5: Summary of achieved accuracy for training and 2 new testing datasets

<table>
<thead>
<tr>
<th>No.</th>
<th>Dataset</th>
<th>No. of URLs</th>
<th>Accuracy Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Training dataset</td>
<td>2973</td>
<td>94.69%</td>
</tr>
<tr>
<td>2.</td>
<td>Test dataset 1</td>
<td>1500</td>
<td>94.27%</td>
</tr>
<tr>
<td>3.</td>
<td>Test dataset 2</td>
<td>3000</td>
<td>94.13%</td>
</tr>
</tbody>
</table>

CONCLUSION

From the experiment, it shows significantly that the 9 identified classification features of URL length, SSL connection, hexadecimal, Google pagerank, Alexa rank, age of domain - year, digit in host, host length and registrar were able to allow us to achieve higher accuracy of 94.69% than 94.56% achieved by Sharma et al. who using more than 9 features tested on the same dataset containing Phishing and safe URLs collected from Twitter. In addition, it was noted that the accuracy achieved for the 2 new testing datasets (unknown data) are almost closer to and not significantly far different from what achieved for the training dataset. In other words, the overfitting for the training dataset and the 2 new testing datasets is not significant in this case.

As such, this can be concluded that the identified 9 classification features are effective in producing more accurate Phishing tweets detection on Twitter.

ACKNOWLEDGEMENT

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The Intention of Green Products Purchasing among Malaysian Consumers: A Case Study of Batu Pahat, Johor

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ABSTRACT

Green product known as environmental friendly product which harmless to the earth and the product that can be recyclable from non-toxic resources. The problems that encourage conduct this research are environmental problem, lack of literature research about the green products purchasing intention and minor companies involved in green production in Malaysia. In order to address this issue, this study aims to investigate the intention of Malaysian consumer towards purchasing the green product and to identify the relationship between knowledge, eco-label and social influences towards consumer purchase intention. Quantitative method was used to collect data through structured survey questionnaire from 200 shoppers at three selected shopping malls in Batu Pahat, Johor. However, from the 200 questionnaires only 93 were acceptable. The data collected were analysed using Statistical Package for the Social Science (SPSS) version 24.0. The findings revealed that the level of mean analysis indicated all items were positively influences consumer purchase intention. Besides, the spearman correlation coefficient test showed that knowledge, eco-label and social influences were positively significant with consumer purchase intention.

Keywords: Green products, Knowledge, Eco-label, Social influence, Intention

INTRODUCTION

Green products known as environmentally friendly products which cause minimum effect to the environment. Green product also defined as an environmental friendly product which have minor impact on the environment and harmless to human health and have quality products criteria on protecting environment by using natural ingredients1. Malaysia is one the country which strongly support the concept of green in the nation2. Green products getting important since 1970 especially in 1990’s due to the concerns of environment and society3.

Environmental issues like rising sea levels, air pollution, water pollution and climate changes are occurring world widely4. Hence, by using the green products, it will help maintain efficient energy, less polluting water, reduce of toxic produce, recycle material sources and many more which don’t harm to the environment5. Green products also provide better air quality indoors and free from chemicals which can reduce health problems. In order to address this issue, this study is conducted to investigate the intention of Malaysian consumer towards purchasing the green product and identify the relationship between knowledge, eco-label and social influence towards consumer purchase intention.

LITERATURE REVIEW

Chen & Chang, (2012) examined the influences of green perceived value, green perceived risk and green trust on green purchase intentions at Taiwan among Taiwanese consumer6. Questionnaire method and structural equation modelling (SEM) used to verify the

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research framework. The finding showed that green perceived value positively influences green trust and green purchase intention while green perceived risk was otherwise from green perceived value.

Furthermore, Tang et al. (2014) examined the Chinese consumer attitude factors that influences their purchase intention toward low-displacement vehicles. MBA students and alumni at a business school in Beijing, China chosen as a target population. Environmental concern, perceived effectiveness belief, functional value perception, awareness of government policy, consumer attitude and consumer purchase intention were the variables used. The outcomes showed that all the variables positively affect consumer purchase intention except for variable awareness of government policy.

Moreover, Kumar & Ghodeswar (2010), examined the factors affecting consumers’ green product purchase decisions among working Indian respondent in Mumbai. Supporting environmental protection, drive for environmental responsibility, green product experience, environment friendliness of companies, social appeal and green product purchase decisions were the factors used in the research. Quantitative and snowball sampling method were used to collect data. The result showed all the factors positively affect green product purchase decisions.

Besides, Wang (2014) examined the consumer characteristics and social influence factors on green purchasing intention among Taiwanese. The data was collect through quantitative method and structural equation modeling (SEM) was used to interpret data collection. The variables used in the research were external locus of control, collectivism value, environmental visibility and subjective norms. Gender, age and education play as control variables in the research. The result showed that all the variables were positively influence on green purchase intentions except external locus of control variable.

Then, Sharaf et al. (2015) conducted a research to determine the influence of Knowledge, eco-label and social influences on the intention of green products purchasing among Malaysian youngsters. local students of Universiti Utara Malaysia chosen as target population and quantitative method used to collect data. The results showed only social influences variable positively affect consumer purchase intention. While, knowledge and eco-label variables negatively influences consumer purchase intention.

Based on previous studies, it can be inferred that different researcher has different finding about the consumers’ intention of green product purchasing. This is because the researches were carried in different places using different methods among different population.

Theoretical framework and research hypotheses: The variables used in Sharaf et al. (2015) research is best suit for this current research project. The theoretical framework was shown in Figure 1 and it was chosen because the research was carried out at Malaysia which have similarity with this current research which will be conduct among Malaysian consumers. Besides, the research conducted on 2015. Hence, by this current research can differentiate what are the changes among Malaysian consumer about green product between this two years’ gap. Shoppers are selected as respondent for this research because shoppers are stronger respondent than students and they are generally more exposed to product in market compare to students.

Figure 1: Theoretical framework

KNOWLEDGE

Knowledge defined as “justified personal belief” and divide into two type of knowledge which are “tacit” and “explicit”. Consumer’s knowledge also means any information that stay in a person memory and their purchasing decision are based on the information kept in their memory. Based on most of the previous research outcomes shows that knowledge positively influence consumer purchasing intention. In contrast, there was a study indicated that young consumer have insufficient knowledge on the importance of green product and green purchasing. So, the hypothesis proposes:
H₁: there is significant relationship between knowledge and consumer purchase intention.

**Eco-label:** Eco-label is known as a form of environmental labelling and have a seal of approval[17]. Consumers’ identify products information based on what they read on the product labelling and the information will let them on purchasing decision[13]. A research to find relationship between eco-label and green purchase intention show that eco-label strongly influenced consumer intention to purchase green product[18]. On the other hand, a study found that teenagers don’t give priority to eco-label during purchasing especially when the price of the product expensive[10]. Thus, the hypothesis propose is:

H₂: There is significant relationship between eco-label and consumer purchase intention.

**Social influences:** Social influences are the information obtain from another person as a sign of reality[19] and a person’s behaviour based on the manners and behaviours of others[9]. Finding of previous researches shows that that social influences positively influence consumer purchasing intention[10,20]. So, the hypothesis propose is:

H₃: There is significant relationship between social influence and consumer purchase intention.

### RESEARCH METHODOLOGY

The questionnaire is structured into three parts which are section A (demography and general information questions), B (variables: knowledge, eco-label and social influence) and C (consumer purchase intention). The questionnaire consists of multiple choice questions, five Likert-scale questions and close ended questions. The sampling technique that applied in this research was non-probability sampling particularly convenience sampling due to the large population. The sample size of this research is 200 respondents as suggested[21]. The research conducted among shoppers at Batu Pahat shopping malls which are Tesco Parit Raja, Batu Pahat mall and Square One mall. SPSS 24.0 was used to analysed the obtained data.

### RESULTS AND DISCUSSION

**Mean level of agreement:** The intention of Malaysian consumer towards purchasing the green product was analysis using mean level of agreement. The mean value was evaluated based on 93 of Malaysian consumer’s answered and the results showed in Table 1.

<table>
<thead>
<tr>
<th>Consumer purchase intention</th>
<th>N</th>
<th>Mean</th>
<th>Degree of mean agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1  I intend to purchase green products in the future</td>
<td>93</td>
<td>3.87</td>
<td>High</td>
</tr>
<tr>
<td>Q2  The probability that I will buy green product is high</td>
<td>93</td>
<td>3.65</td>
<td>Moderate</td>
</tr>
<tr>
<td>Q3  I will practice greener product purchasing</td>
<td>93</td>
<td>3.71</td>
<td>High</td>
</tr>
<tr>
<td>Q4  I glad to purchase green product because it is environmental friendly</td>
<td>93</td>
<td>4.05</td>
<td>High</td>
</tr>
<tr>
<td>Q5  I may buy green product when it is appropriate</td>
<td>93</td>
<td>4.03</td>
<td>High</td>
</tr>
</tbody>
</table>

The highest mean value had obtained by question number four which was 4.05. It’s shows that Malaysian consumer are more concern about environmental issues. Then, followed by question number five, one and three also achieved a positive result from Malaysian consumer with ascending order of mean value were 4.03, 3.87 and 3.71 respectively. However, question number two achieve least value of mean over all of the five questions which was 3.65. It’s implicate that Malaysian consumer have low willingness to buy green product. Many studies have strongly proved and been shown that increasing in environmental concern among consumers. Consumers become aware of environmental issues and it could be seen by increase in demand of ecological products in markets.

On the contrary, there was a disagreement between consumer purchase intention due to their overestimation of the green product usage on environmental issue[22]. A researcher stated that consumers were not equipped and encouraged enough to make decision on green product purchasing because they not concern with the environmental issues[23]. However, only few studies indicated that did not support this current research. While, there were many studies have been proven with this current research’s outcomes[12,16,20,24,25].

**Hypothesis Testing:** Spearman correlation test is using to determines whether two paired variable of data in this research have a significant relationship or vice versa. The significance of coefficient value enables to find out which independent variables will influence the decision greatest. Table 2 show the verbally describe the strength of the correlation to use as guide for the absolute values of significant of coefficient.
Table 2: Significant of coefficient level

<table>
<thead>
<tr>
<th>Correlation coefficient value</th>
<th>Relations strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.90–1.0</td>
<td>Very strong</td>
</tr>
<tr>
<td>0.7–0.89</td>
<td>Strong</td>
</tr>
<tr>
<td>0.40–0.69</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.20–0.39</td>
<td>Weak</td>
</tr>
<tr>
<td>0.00–0.19</td>
<td>Very weak</td>
</tr>
</tbody>
</table>

Table 3 illustrates the summarised result of hypotheses tests. All the hypotheses test was accepted due to the significant p-value less than 0.05 and all the data were significance. The highest correlation coefficient was H₁ with 0.630 value shows that the knowledge is the most important factor that affecting consumers’ purchase intention. Followed by social influence factor and eco-label factor with 0.619 and 0.315 correlation coefficient value respectively.

Table 3: Results of Hypotheses test

<table>
<thead>
<tr>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis Correlation coefficient Sig Hypothesis accepted or rejected</td>
</tr>
<tr>
<td>H₁ There is significant relationship between knowledge and consumers’ intention 0.630 0.000 Accepted</td>
</tr>
<tr>
<td>H₂ There is significant relationship between eco-label and consumers’ intention 0.315 0.002 Accepted</td>
</tr>
<tr>
<td>H₃ There is significant relationship between social influence and consumers’ intention 0.619 0.000 Accepted</td>
</tr>
</tbody>
</table>

The impact of knowledge toward customer purchase intention: The relationship between knowledge and consumer purchase intention was found to be significant and has a positive relationship. Spearmen correlation coefficient is \( r = 0.630 \) which was positive value with moderate relation strength and significant value \( p = 0.00 \) which was less than 0.05. Hence, \( H₁ \) is accepted. The results show that knowledge is one of the main factors that contribute to increase in customer purchase intention. This results supported by previous studies\(^{12,27}\).

The impact of eco-label toward consumer purchase intention: The relationship between eco-label and consumer purchase intention was found to be significant and has a positive relationship. Spearmen correlation coefficient was \( r = 0.315 \) which is positive with weak relation strength and significant value \( p = 0.02 \) which less than 0.05. Thus, \( H₂ \) is accepted. The results indicated that although eco-label factor has weak relation strength but it also contributes to increase in consumer purchase intention. It's also supported by few previous studies\(^{18,22,28}\).

The impact of social influences towards consumer purchase intention: The relationship between social influences and consumer purchase intention was found to be significant and has a positive relationship where consists Spearmen correlation coefficient of \( r = 0.619 \) and significant value \( p = 0.00 \) which less than 0.05. Hence, \( H₃ \) is accepted. The results show that social influences is a second highest factors that contribute to increase in customer purchase intention. One of the previous study had support this results\(^{10}\).

**CONCLUSION**

In short, there were three key factors that raise consumer purchasing intention which concern of knowledge, eco-label and social influences. From the result, it was noted that knowledge is the strongest factor that has positively influences consumer purchasing intention. Followed by social influences factor and eco-label factor respectively. It's shows that knowledge factor can be implicit that a person who has knowledge related to environmental issue have a strong preference in purchasing green product.

**ACKNOWLEDGMENTS**

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**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** IJRISE Journal Reviewer Committee
REFERENCES


Perception and Knowledge of Medical Students with Different Teaching Learning Activities in Pharmacology in a Malaysian University: A Comparative Study

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1Dept. of Pharmacology, Faculty of Medicine, MAHSA University, Kuala Lumpur, Malaysia; 2Dept. of Community Medicine, LNMCR & JK Hospital, Bhopal, India

ABSTRACT

Objective: To assess the perception and knowledge acquired by medical students with the use of Computer assisted learning (CAL), self-learning package (SLP) and didactic lecture as teaching learning activities.

Method: This is a quasi-experimental questionnaire based study, conducted among 169 year 1 MBBS students, by dividing them into 3 groups by block randomization. Group A (n=56) received didactic lecture, group B (n=57), CAL and group C (n=56) a SLP on ‘Pharmacotherapy of Bronchial Asthma’. The sessions were held in parallel. Pretest and post-test was given to assess knowledge gain and a validated questionnaire was used to evaluate the perception of the students. The data was analyzed using Student’s paired “t” test for pre and post test scores. Two sample t test with equal variance was used to compare the difference between two means among groups.

Results: In pre to post-test score analysis, the mean improvement was significantly higher in group B and group C. The difference between two means was highly significant for group A and B (p=0.0000) and for group B and C (p=0.0002). However there was no significant difference between means of group A and C (p=0.1494). Students in group B perceived that they developed conceptual understanding and it helped learn actively.  Students from group A & C opined that they would prefer an alternative teaching-learning activity.

Conclusion: CAL being an effective and well-perceived TLA by the students, it will be worthwhile to further explore the scope of CAL for more topics in the curriculum.

Keywords: Computer-Assisted Learning, Self-Learning Package, Teaching-Learning Activity

INTRODUCTION

In today’s era, many medical educators are experimenting with innovative ways of teaching-learning that incorporate active student participation, unlike traditional didactic lectures. Medical council of an South-east Asian country has put the emphasis more on non-didactic teaching–learning methodology as one of its vision for medical education.1

Passive lectures provide the lowest knowledge retention rate of any method of learning and encourage learning at the lowest levels of cognitive function. In contrast, active learning that involves discussion, practicing by doing, or teaching others, results in much more effective long-term learning at higher levels of cognitive function. The factual information that teachers spend so much time conveying to students is rapidly outdated, and it is the critical thinking, problem solving, communication, and life-long learning skills that best prepare students for the decades of practice after graduation.2

Computer-assisted learning (CAL), E-learning, Self-Learning Package (SLP), Crosswords, Quiz and seminars are few of the methodologies focusing on self-directed learning. Methods like CAL, E-learning and SLPs give an opportunity for students to improve the learning
experience by ease of access, greater interactivity, and individual choice concerning the pace and mix of learning. At the same time, it also offers advantages for teachers such as improved distribution of learning content, standardization, and tracking of learner activities.

The broad goal undergraduate pharmacology teaching is to inculcate a rational and scientific basis of therapeutics in students. They must develop an understanding of concepts in pharmacology, and acquire knowledge about drugs and therapeutics, as well as the skills to select and prescribe medicines based on clinical conditions and pharmacological properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national and public health importance.

Curriculum innovation is the need of the hour, considering the vast knowledge explosion in medicine, development in information-technology and the necessity of continuing medical education for smooth transition of students into able physicians. Students’ acceptability for this innovation is equally important other side of the coin that should be studied via experimenting in teaching-learning activities and feedback. This study was designed with the aim to assess the perception and cognitive gain of medical students on computer assisted learning, self-learning package and didactic lectures as teaching learning activities.

METHODS

This study is a quasi-experimental study was carried out over one-and-half months. The medical students from year 1 willing to give informed consent were included in the study. Ethical clearance will be obtained from the institutional ethics committee. Informed consent was obtained from all the students included in the study. Demographic details were obtained from the subjects under the study. The students were divided into three groups by block randomization – Group A, B and C. Group A will received didactic lecture, group B computer assisted learning (CAL) and group C self-learning package (SLP). All the three groups will receive different teaching learning activity but on the same topic – ‘Pharmacotherapy of Bronchial asthma’.

A validated questionnaire was used to evaluate the perception of the students on the different teaching learning activities. The questionnaire consists of 9 items with a 5 point-Likert scale. The students marked their responses as 1-Strongly disagree, 2-disagree, 3-agree, 4-slightly agree, 5-strongly agree. The questionnaire was distributed to all year 1 medical students. They were asked to complete the questionnaire anonymously. Simple descriptive statistics was used to generate frequencies, percentages and proportions.

Pre-test and post-test was administered before and after the TLAs respectively. A set of 5 MTFs were designed for the pre-test and post-test. The questions will be verified by the subject experts. The same questions were administered for the pretest as well as the post test. All medical students from year 1 MBBS studying in MAHSA University and willing to sign the informed consent form were included in the study.

**Table 1: Descriptive statistics for Pre-test results**

<table>
<thead>
<tr>
<th>Pre-test variables</th>
<th>Students (n)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>56</td>
<td>18.1</td>
<td>18</td>
<td>4.6</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Group 2</td>
<td>57</td>
<td>17.8</td>
<td>18</td>
<td>4.6</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Group 3</td>
<td>56</td>
<td>18.6</td>
<td>19</td>
<td>5.7</td>
<td>9</td>
<td>33</td>
</tr>
</tbody>
</table>

**Table 2: Descriptive statistics Post test results**

<table>
<thead>
<tr>
<th>Post-test variables</th>
<th>Students (n)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>56</td>
<td>19.1</td>
<td>20</td>
<td>4.6</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>Group 2</td>
<td>57</td>
<td>21.7</td>
<td>22</td>
<td>5.2</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>Group 3</td>
<td>56</td>
<td>20.2</td>
<td>21</td>
<td>5.8</td>
<td>8</td>
<td>34</td>
</tr>
</tbody>
</table>
### Table 3: Two sample T test with equal variances for group 1 and group 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Students (n)</th>
<th>Mean</th>
<th>Standard Error</th>
<th>Standard Deviation</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>56</td>
<td>.9821429</td>
<td>.3479915</td>
<td>2.60413</td>
<td>2847523</td>
<td>1.679533</td>
</tr>
<tr>
<td>Group 2</td>
<td>57</td>
<td>3.842105</td>
<td>.3971937</td>
<td>2.998747</td>
<td>3.046431</td>
<td>4.63778</td>
</tr>
<tr>
<td>Combined</td>
<td>113</td>
<td>2.424779</td>
<td>.2958321</td>
<td>3.144739</td>
<td>1.838625</td>
<td>3.010932</td>
</tr>
<tr>
<td>Difference</td>
<td>-2.859962</td>
<td>.5287342</td>
<td></td>
<td></td>
<td>-3.907684</td>
<td>-1.81224</td>
</tr>
</tbody>
</table>

CI – 95% confidence interval, *highly significant

### Table 4: Two sample T test with equal variances for group 2 and group 3

<table>
<thead>
<tr>
<th>Group</th>
<th>Students (n)</th>
<th>Mean</th>
<th>Standard Error</th>
<th>Standard Deviation</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 2</td>
<td>57</td>
<td>3.842105</td>
<td>.3971937</td>
<td>2.998747</td>
<td>3.046431</td>
<td>4.63778</td>
</tr>
<tr>
<td>Group 3</td>
<td>56</td>
<td>1.732143</td>
<td>.3818029</td>
<td>2.857151</td>
<td>.9669928</td>
<td>2.497293</td>
</tr>
<tr>
<td>Combined</td>
<td>113</td>
<td>2.79646</td>
<td>.2918941</td>
<td>3.102877</td>
<td>2.218109</td>
<td>3.374811</td>
</tr>
<tr>
<td>Difference</td>
<td>2.109962</td>
<td>.5511791</td>
<td></td>
<td></td>
<td>1.017764</td>
<td>3.202161</td>
</tr>
</tbody>
</table>

CI – 95% confidence interval, *highly significant

### Table 5: Two sample T test with equal variances for group 1 and group 3

<table>
<thead>
<tr>
<th>Group</th>
<th>Students (n)</th>
<th>Mean</th>
<th>Standard Error</th>
<th>Standard Deviation</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>56</td>
<td>9821429</td>
<td>.3479915</td>
<td>2.60413</td>
<td>.2847523</td>
<td>1.679533</td>
</tr>
<tr>
<td>Group 3</td>
<td>56</td>
<td>1.732143</td>
<td>.3818029</td>
<td>2.857151</td>
<td>.9669928</td>
<td>2.497293</td>
</tr>
<tr>
<td>Combined</td>
<td>112</td>
<td>1.357143</td>
<td>.2595837</td>
<td>2.747176</td>
<td>.8427604</td>
<td>1.871525</td>
</tr>
<tr>
<td>Difference</td>
<td>-.75</td>
<td>.5165961</td>
<td></td>
<td></td>
<td>-1.773772</td>
<td>.2737722</td>
</tr>
</tbody>
</table>

CI – 95% confidence interval

**RESULTS**

A dedicated data entry module was developed for the study. Data quality was ensured by a random check of the entered data. Data were entered in MS Excel and analyzed using Stata 11.0. Descriptive statistics such as frequencies (percentage) and mean scores (Standard Deviation) for continuous variables were reported. All students in the three groups took the pre-test as well as the post-test. Pre-test and post-test scores were analyzed using descriptive statistics for the three groups. The pre to post-test score analysis (Table 1 and 2), showed that the mean improvement was significantly higher (p<0.05) in group B (21.7 ± 5.2) and group C (20.2 ± 5.8). However there was no significant improvement in the average post-test score in group A.

Two sample T test with equal variances was applied to compare the difference between two means among groups and t value assessed variance and significance was determined at p<0.05. The difference between two means was highly significant for group A and B (p=0.0000), as shown in Table 3 and for group B and C (p=0.0002), as shown in Table 4. However there was no significant difference between means of group A and C (p=0.1494), as depicted in Table 5.

The response rate for the perception and feedback questionnaire was 100% in all the three groups. Students in group B perceived that they developed better understanding of the topic with CAL (98.24%) and it motivated them (96.5%)(Figure1). The visuals and animations in the CAL helped the students understand...
concepts in a lucid manner. One interesting observation was that, none of the students from group B would have preferred an alternative mode of TLA for this topic. Students from group C opined that SLP gave them time to read and understand the topic at their own pace and free from external pressures. They also shared that SLP gave them a chance to link their basic knowledge of pharmacology into therapeutics in a systematic way. Students from group A, who received the conventional didactic lecture, were keen on exploring other TLAs to break the monotony and passive learning involved with lectures. Open comments in the questionnaire suggested that, overall CAL and SLP was perceived as a good learning tool by the students in group B and C, respectively.

Students from group A, who received the conventional didactic lecture, were keen on exploring other TLAs to break the monotony and passive learning involved with lectures. Open comments in the questionnaire suggested that, overall CAL and SLP was perceived as a good learning tool by the students in group B and C, respectively.

**DISCUSSION**

Several studies have tested the traditional form of teaching versus the newer methodologies. Subramanian et al demonstrated a significant improvement in student learning retention with an interactive medical software compared to traditional didactic lecture format. It was reported that the software provides the user with a highly focused set of evaluative and interventional tasks to treat memorable virtual patients in a visual case-based format.

In another study on Computer-assisted learning (CAL) in anatomy in an international medical school for three consecutive years, it was observed that CAL-enrolled students improved their performance on required anatomy core curriculum oral examinations (P < 0.001), suggesting that computer-assisted learning may play an active role in anatomy curriculum improvement.

A quasi-experimental single group pre-test/post-test study was conducted with fourth-semester students of the second professionals course (II MBBS) by Gaikwad et al, observed that interactive E-learning module in pharmacology was moderately effective and well perceived by the students. E-learning technology blended with traditional teaching to encourage active learning among students is definitely a step forward towards self-directed learning.

However, there have been few reports that recommend that CAL alone should not be used to replace conventional teaching, based on their findings. This highlights the viewpoint of Joseph T. DiPiro, which conveys that teaching of factual information (via lectures) will always be necessary but attempts should made to develop rational thinking in the students, which would stay with them in the long run.

A Malaysian study that evaluated the role of CAL in pharmacology teaching, reported that undergraduate medical students find that CAL reinforces the lectures, enriches the learning experience and lets them personalize learning at their own pace within the time-tabled slots.

Thus it is worth mentioning that, one single approach to teaching does not work for every student or even for most of the students. The educators’ awareness of the various learning styles of the students and their efforts towards matching the teaching and learning styles may help in creating an effective learning environment for all the students.

**CONCLUSION**

The study concluded that CAL was an effective and well-perceived TLA for teaching pharmacology among MBBS students. This can be a useful teaching learning activity for pharmacology to encourage active learning among the students.

**ACKNOWLEDGMENT**

The authors acknowledge the Year I MBBS students, MAHSA University for their active participation in this study and also the Dean, Faculty of Medicine and management MAHSA University for their support.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Nil
REFERENCES


Elements of Feminism in the Select Novels of Bharati Mukherjee

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ABSTRACT
This paper is an in-depth analysis of women characters in the novels of Bharati Mukherjee. Bharati Mukherjee, a famous diasporic writer born in India and settled in America, she calls herself as an American writer and not a hyphenated immigrant. The characters Tara in ‘Tiger’s Daughter’, Dimple in ‘Wife’ and Jasmine in ‘Jasmine’ are analysed in detail in terms of women migrants. The change in place and time brings about a change in the behaviour of human beings. Such kind of physiological and psychological changes happen irrespective of the gender. The conventional experience of migrants revolves round the phases as alienation, displacement, dislocation and depression. Breaking this, Mukherjee introduces the feelings of acceptance, delight and pleasure in being a part of new land. Feminism and feminist theory are applied for the study. The problems undergone in various situations and the transformations of the heroines are explored in the paper.

Keywords: Feminism, Bharati Mukherjee, Diaspora, Transformations

INTRODUCTION
The word ‘Feminism’ can be defined or described in different ways according to one’s understanding on the subject and perception towards the term. But, it’s still a debatable topic as what it actually stands for. Feminism is equality of rights for a few, a prominent political movement for some group of people, the spirit to keep the rights of women up for few other. The Oxford English Dictionary defines the word feminism as a belief in the principle that women should get equal rights and opportunities as men. However, feminism is a movement which functions for women with wider spectrum, covering issues like identity, independence, right to action in education, career and family. With the growth of feminism across the globe, the Indian feminists came to light. Women have become independent and started fighting for equality, rights, freedom etc. Women social workers fight against discrimination, patriarchy, abortion, domestic violence and all other issues connected directly or indirectly to women.

Women Writers: Feminist theory is the expansion of feminism into theoretical and philosophical ground. Works related to roles of women, lives of women and feminist politics are covered under this theory. New issues are related with the conditions of the woman, gender identity and relationships within and between genders. Many women writers involve feminism in their piece of writings either it is a prose or poem. Fiction includes feminism as one of the major subjects. Indian feminists like Anita Desai, Nayantara Sahgal, Kamala Das, Bharati Mukherjee have evolved as prominent writers in these last two decades. Bharati Mukherjee has become very popular where her themes include alienation, immigrant experience, expatriation, clash of culture, multiculturalism, racial discrimination, transformation of women, attitude of revenge, sense of new morality, man-woman relationship, woman in new land.

Bharati Mukherjee: Bharati Mukherjee - born in India, migrated to Canada and then to U.S.A at different stages of her life. She has many novels to her literary credits. She is a woman of energy and enthusiasm. Her novels reflect her thoughts and ideas on women. Her first novel was published in the year 1971, when she was in Canada. Racial discrimination was on the top during that period. The novel explores the cultural shock met by the protagonist Tara, who was born in India and moved to America, where she marries an American. She suffers from nostalgia and homesickness as she misses her native land, people and culture. She returns to India after a long period of seven years and experiences a new and different society. Tara denies to forget the past and also
is not ready to accept the present life. Only a few are brave enough to accept the new and others fall victim to depression, despair and loneliness.

Wife: Mukherjee has the element of transformation in most of her novels. Dimple, protagonist of the novel ‘Wife’ plays different roles. Mukherjee shows through the novel Wife how Dimple undergoes transformation from a simple girl in Barlygunge to Amit Basu’s wife. Dimple, now the wife of Amit Basu wants to change herself, in an effort to please her husband. She makes several efforts like dressing up differently, trying new hairstyles etc. to please her husband, Dimple took to wearing bright colours: red, oranges and purples. Amit even compliments her on the different looks. In the same regard Mukherjee herself states that the kinds of women she writes about are those who are adjusting. Indian daughters have been raised to please, trained to be adaptable wives, and that adaptability is working to the women’s advantage when they come over as immigrants.

Attitude of revenge: The novel has also several examples where the heroine is full of revenge against the unfavourable. M. Rajeshwar writes, “the characters are therefore shown grappling on one hand with the psychic conflicts of personal origin. These conflicts and traumas become too pronounced at a particular point of time in their life when a part of their psychic apparatus refuses to submit to several hostile cathexes they manifestly display three distinct tendencies: some move from neurosis to psychosis, others arise at a compromise solution for their problems and yet another group sets out to become compulsive idealists because they find the realities of life too harsh or repulsive to put up with.”

The attitude of revenge, an element of feminism is also seen in the novel Wife. Dimple is shown as a sadistic woman. She gets sick of obeying her husband’s orders and the transformation happens slowly. From a traditional submissive woman, she changes into a crazy, unconventional wife, not ready to take orders but to give orders herself. The dominating husband, Amit has become overbearing for Dimple. To her, disobeying him would mean taking revenge. When Amit suggests her to wear a cotton sari while cooking, Dimple feels angry and decides: “I’ll wear synthetic saris if I want to! I’ll wear any god-damn thing I want to, so there!” Dimple is hostile to her husband, she wants to hurt him while he’s asleep and she is so much filled with rage and vengeance against him that: “That night, trapped between the cold wall and Amit’s heavy body, in post nightmare lucidity she sought revenge, she had a sudden desire to examine the body… until she knew just where to strike or pierce and make him bleed in the dark. Her own intensity shocked her –she had not considered herself susceptible to violence… “Love is dread,” she whispered loudly to the sleeper.”

Dimple’s anger and violence becomes severe when her own body seemed curiously alien to her, filled with hate, malice, an insane desire to hurt, yet weightless almost airborne. The attitude of revenge in Dimple is abnormal and several critics have different views about this insane attitude. While some find it revolting, others have an explanation for Dimple’s undesired behaviour: “She has already been in a sick state of mind ever since she left India but the alienation from her husband, environment and the sham and outward glitter, fluidity and meaninglessness of American life drive her to fits of psychic depression and ultimate insanity.”

Jasmine and the letter ‘J’: Jasmine- a novel by Bharati Mukherjee can be read as a feminist novel. The protagonist shows a proper balance between modernism and tradition, which is also an aspect of feminism. There are various instances of transformation of the protagonist in the novel. She changes herself and acquires multiple identity all the way through the novel. The heroine ‘Jyoti’ evolves as a village girl of Hasnarpur, transforms to ‘Jasmine’ after her marriage with Prakash, she then becomes ‘Jase’ the undocumented immigrant, further changes into ‘Jane’ the Manhattan Nanny, finally ‘Jane’ as the Iowan woman. The letter ‘J’ represents as an element of continuity, transformation and feminism throughout the novel. Elizabeth Bronfen observes: “This ‘J’ serves as a signifier for the dialect of a progressive engendering of identities as these bar already existing identities, putting them under erasure without consuming them. …. Jasmine’s dislocated other speaks out a self-conscious and self-induced effacement in the voice of resilient, and incessantly self-refashioning hybridity.”

Transformation of Jasmine: Jasmine is on an endless journey to explore, seek and find bright ways of life which are very different and new from the conventional ways. Jasmine realises the change herself: “In the white lamplight, ghosts float towards me. Jane, Jasmine, Jyoti.” Indira talks about this in an explicit manner: “With healing touch of people like Lillian Gordon, Kate and Taylor, who treated her as an intelligent, refined,
sincere person, jasmine blooms from being a different alien with forged documents into adventurous Jase living only for the present. The tugging between the opposing forces does not intimidate her, rather it excites her. Amidst the other immigrant domestics who hang suspended between the two worlds, Jasmine feels proud that she is getting rooted in the new world.”

Jasmine was only seven, an innocent seven-year-old girl in Hasnapur in the village of Punjab. Then she was married to Prakash Vijh and became Jasmine, the wife of a man who wanted her to change. Then, in America She was Jane, wife of a divorced man who is in his fifties. In a lifespan of twenty-four years, she has undergone many changes and accepted each change as a new challenge. She has played a completely different role at each transformation. Sandra Ponzanesi writes: “The transformation of identity from dutiful submissive widow into assertive, criminal and individualistic American woman is in full swing.” The transformation in the woman is reflected through the words of Jasmine herself. She is well aware of the change: “He wanted to break down Jyoti I’d been in Hasnapur and make me a new kind of city woman. To breakoff the past, he gave me a new name: Jasmine. He said, “you are small and sweet and heady, mu jasmine. You’ll quicken the whole world with your perfume.” “Jyoti, Jasmine: I shuttled between identities.”

Portrayal of Women: In her first novel, ‘The Tiger’s Daughter’ - Tara is portrayed as an immigrant sandwiched between two cultures. The novel was written when the author was in expatriate phase. In a new country, racial discrimination is common. Only a few are brave enough to acclimatise the new land. Others suffer a lack of identity as they cannot decide to which place they belong to.

Similarly, Dimple in ‘Wife’ suffers such kind of situation. Initially, she changes herself to persuade her husband. Later on, when moved to America, she wants to be free and make her own decisions. She had her own set of dreams and desires. But the limitations confined to her husband, aggravates her thoughts and she gets depressed. She cannot be a submissive wife nor a liberal. She is left in a state of despair. The depression leads to destroy herself as well killing her husband.

Jasmine does not want to follow the age old traditions followed for years in the past. She is not worried of the scar on her forehead, instead has a positive attitude towards life. She considers it as the ‘third eye’ and calls herself as a sage. She would probably get insight into new worlds to explore with this third eye. Thus, Bharati Mukherjee’s heroines are different, brimming with hope and ready to lay down rules for themselves. Mukherjee also shows that a woman is no longer a humble petty creature, content and happy with what life has to offer instead a fighter, who wants to achieve what she deserves. Thus the dreams and desires of new woman are different. Jasmine is a completely different girl, right from her childhood. She never follows or worries about the ancient beliefs but she makes a new path for herself and steady marching on it, with whatever the obstacles met, overcomes with a spirit. In an interview to the magazine Bomb, she says, “I think of Jasmine and many of my characters, as being people who are pulling themselves out of the very traditional world in which their fate is predetermined, their destiny resigned to the stars. Traditionally, a good person accepts this. But Jasmine says, “I’m going to reposition the stars.”

**CONCLUSION**

Many critics have recognised Mukherjee as a feminist writer, as she has taken up issues of female gender, related to those who migrate to foreign countries. She has explored the possibilities of freedom offered to women in the new land. Her woman characters are strong survivors, who venture out to fulfil their dreams and desires. Mukherjee believes in liberation of the heart and mind. The bold and assertive characters pervade in all her novels. The women characters project her beliefs and so she makes them to act with courage. Her heroines have pushed out of the domestic barrier of home to reach beyond geographical limits of the country itself. Mukherjee upholds the concept of globalisation calling the world a global village. Her characters convey the message to embrace the new culture and its people, when we are a part of it. Her works reflect transformation which comes inevitably when one migrates from one’s own country to a foreign one. This journey has many ups and downs, which becomes clear through her protagonists. All her protagonists are women who are bold and assertive. Thus, through her characters she holds up the ideals of feminism.

**Conflict of Interest:** Nil

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Portrayal of South Asian Women as Immigrants in the Select Novels of Bharati Mukherjee

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ABSTRACT

This paper is an in-depth analysis of portrayal of South Asian Women in the select novels of Bharati Mukherjee. As a result of globalisation, the world has become a global village due to which, migration has become very common and people’s movement has increased considerably in recent days. The process of migration, settling down in new land and adapting to the new culture involve several issues and affect both men and women irrespective of the gender. Bharati Mukherjee is an Indian-born diasporic writer who achieved a special place in Indian diaspora as well in the American Literary World. Being an immigrant, Mukherjee exhibits the lives of the migrant women lively and artistically. She expresses the social reality of the Asian Immigrants’ lives in the contemporary America. She perfectly merges fact and fiction in her writings. She focusses on the sufferings and pains of the immigrants through her protagonists. The voyage of migration includes expatriation, racial discrimination, alienation, displacement and cultural shock. The women characters face many problems, endures all odds and emerge as survivors. The characters Tara in the Tiger’s Daughter and Dimple in Wife denies to forget the past and accept the new. But, Jasmine undergoes many transformations at different locations and changes her identity along with the change of her names, where she emerges as a rebel and survivor, giving confidence and creates an optimistic view among the readers. She serves as an example for all the South Asian women immigrants to accept, adapt, adopt the new culture.

Keywords: South Asian Women, Indian Diaspora, Transformations, Immigration

INTRODUCTION

Diaspora is an important and inevitable phenomenon of this modern age. People travelled to other countries for job, economic freedom and various other reasons decades ago. The twentieth century witness massive migratory movements of various people across national and continental boundaries. The reasons may vary and destinations may differ. In the present situation, people migrate for different purposes like desire, vacation, to admire nature’s beauty etc. The displaced persons find themselves in cultural dilemma while adapting to the new culture. These migrants find a conflict in Language, Culture, Climate, Attitude of people and Traditions. Analysing women’s writing is a useful vehicle for theorising the field of South Asian American studies because there are certain stories told by these women that need to be heard as a part of collective memory relating to South Asian diaspora. These are stories which give legitimacy to the inner lives of women from diverse groups- across class, colour and regional differences.

Though the migration gives new forms of personal and political freedom, the pleasures are subverted by a sense of loss, discontinuity and broken identity. Migration also creates problems like adjustment, adaptation and assimilation in relation to religion, language and culture. The immigrant experiences share fundamental characteristics and the immigrants face different kinds of problems and sufferings irrespective of the gender. But, women are suffered in large compared to men. In an interview with Sybil Steinberg she says: “It is the wisest of my novels in the sense I was between both worlds. I was detached enough from India so that I could look back with affection and irony, but I didn’t know America long enough to feel my conflict. I was like a bridge poised between two worlds.”

Mukherjee as American Writer: “We are refugees and mercenaries and guest workers; you see us sleeping in airport lounges; you watch unwrapping the last of our native foods, unrolling our prayer rugs, reading our holy books, taking out for the hundredth time an aerogram
promising a job or space to sleep, a newspaper in our language, a photo of happier times, a passport, a visa, a laissez passer”,” says Mukherjee about the new Indian diaspora in her novel Jasmine.

The dangling self and immigrant sensibility find expression in the novels of Bharati Mukherjee. The Indian born Mukherjee, herself being an immigrant in Canada later in USA has an intrinsic and intimate knowledge of both the Western and the Eastern cultures which enables her to portray emotions, fears and doubts of cultural transplant in an authentic and skilful manner. In most of her novels, the protagonists move to America and the journeys reveal clear feminist perspectives. After her marriage with Clark Blaise, her dilemma begins, which has caught between two cultures – old and the new. This conflict forced her to deliberately write on the theme of immigration, assimilation, alienation which in turn made her a popular figure in a short span of time in American Literature as well one among diasporic writers. Racial discrimination in Canada caused pain and bitter stay and made her to have a very difficult phase of life. Few years later, the couple moved to the USA. The life was quite adjustable and Mukherjee enjoyed her stay in America. She declared that India was her past, proud of but at the same time she felt that her life is in America. She feels herself to be a part of American literary world. She never degrades the adopted country to glorify the native one.

Mukherjee claims in interview to Alison B Carb, “We immigrants have fascinating tales to relate. Many of us have lived in newly independent or emerging countries which are placed by civil religious conflicts… when we uproot ourselves from those countries and come here, either by choice or out of necessity, we suddenly must absorb 200 years of American history and learn to adapt to American Society…. I attempt to illustrate this in my novels and short stories. My aim is to expose Americans to the energetic voices of new settlers in this country”, while narrating her tale of transition and transformation from an expatriate Indian to the American citizen.

The Tiger’s Daughter: Tara, the protagonist of the novel The Tiger’s daughter encounters a cultural shock first in the adopted land, when she goes to America for higher studies and the second – when she returns to the native land India after seven years of stay in the USA with her American husband. The vast difference between the two worlds, cultures, people, life style made her depressed and frustrated. Though her classmates approached her in a friendly manner, Tara rejects and hesitates towards their friendship. Even little things pained her. “New York… had been exotic… there were policemen with dogs prowling the underground tunnels. Because girls like her…. we’re being knifed in elevators in their own apartment buildings… the only pollution she had been warned against in Calcutta had been caste pollution. New York was certainly extraordinary, and it had driven her to despair.” She had a feel of discrimination when her friends fail to share her bottle of mango chutney. She used to defend her family and native country, whenever she talks with others. She prays Kali to give her the strength and not to break down before the foreigners. It is ironic that she fell in love with an American, David Cartwright. Though New York was extra ordinary, it depressed her and when the atmosphere seemed oppressive and unbearable, “she had shaken out all her silk scarves, ironed them and hung them to make the apartment more Indian”5. She felt herself a victim of a love match. David being totally western was unaware of the traditions of India and so Tara could not express her views, her family background and life in Calcutta to him. “David knew nothing of Calcutta, Camac Street, the rows of gods, the power and the goodness of the Bengal Tiger”6. Uprooted from the native soil and culture, Tara is torn between the feelings of rootlessness and nostalgia and feels quite insecure in the new land and longs for her homeland.

Wife: Wife is a novel about a Bengali Girl Dimple, who plays the leading role. She is eager to get married. In fact, her very existence is considered as a waiting – to enter into the blessed state of matrimony. She lives with the dreams of marriage. After several processes, her father finds her a groom – Amit Kumar Basu, an engineer. After the marriage, the couple emigrates to America. Unlike Amit, who has come to America for economic reasons, Dimple is chasing a dream of liberation and self-fulfilment in New York. But New York terrifies her. “She had never seen such bigness before; the bigness was thrilling and a little scary as well.” She finds difficult to adjust in the new environment. She does not mingle with others; she is alone like in a solitary confinement. She is scared of self-service elevators, of policemen, of gadgets and appliances. She does not want to lose her identity but she feels isolated, trapped, alienated and marginalised. 

She tries to stab her husband with a paring knife when he comes up with a playful gesture. This kind of action shows her affected mental health.
Mukherjee says in an interview about Asian immigrants: “[When an Asian man comes to America] he comes for economic transformation, and he brings a wife who winds up being psychologically changed. This is one of the tragedies you see being played out in all New Jersey shopping malls these days. The Indian women walking around in the malls with nothing to do all day, while the men are out busily making money. The men have a sense of accomplishment. They have no idea of staying here. The idea is saving money and going. But they don’t realise the women have been transformed.”

The novel explores the different outcomes of immigration. Mukherjee concentrates on disillusionment in the novel Wife. To survive and to do well in United States, one must become American in one’s thoughts and actions. It is of no use to remain Indian in a claustrophobic ghetto. Those who are incapable, break down like Dimple.

Jasmine: Jasmine is Mukherjee’s most comprehensive attempt to explore through fiction the nature of South Asian immigrants and to account what makes success and failure in immigration. Jasmine is a narrative which depicts one of Mukherjee’s successful immigrants. Someone who is ready to accept the changes and it is a long endless tale of happenings. It is a chain of lives in different locations. The novel generalises the secret of the success people like Mukherjee adjusted in the new land. Jasmine born in a small village in Hasnapur, where daughters are considered as a curse to the family, she studied English against all odds. She was non-conforming, a rebel and defy social constraints at every turn. Jasmine progresses from being a village girl in a rural and patriarchal society in India to being a tough and liberated American women in Iowa. The way Jasmine takes on the mainstream USA is a mixture of the humanistic individualism and medieval suppression of the individual’s self. She judges her actions according to her own humanistic standards.

CONCLUSION

Mukherjee has used her own successful integration into the American society as the basis of many of her novels’ success with which South Asians have become part of the melting pot. She has written artistically about their successes and failures and offers us fascinating glimpses into their lives and the Indian diaspora on the basis of a deeply felt and thought-provoking perspective on immigration. The voyage of migration includes expatriation, racial discrimination, alienation, displacement and cultural shock. The women characters face many problems, endures all odds and emerge as survivors. The characters Tara in the Tiger’s Daughter and Dimple in Wife denies to forget the past and accept the new. But, Jasmine undergoes many transformations at different locations and changes her identity along with the change of her names, where she emerges as a rebel and survivor, giving confidence and creates an optimistic view among the readers. She serves as an example for all the South Asian women immigrants to accept, adapt, adopt the new culture.

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Plastic Pollution, A study of Knowledge, Attitude and Practices Among Students

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ABSTRACT
Over the years, plastic pollution has unquestionably surfaced as most pervasive pollution problem of the century afflicting land, waterways and seas. The intemperate interference of the mankind in the natural cycles has been wreaking havoc on natural environment. It is necessary to understand as to what extent the individuals are aware of these facts, what are their attitude and whether they are at all taking any step to address these issues. The objective of the study is to have complete knowledge, attitude and practice among the students who are pursuing PhD, Post Graduate and Under Graduate studies. Students belonging to diverse academic background were the respondents. Area of study is the capital city of India i.e. Delhi and NCR. A structured questionnaire was prepared to assess the KAP of students towards plastic pollution. A Google Form was created and shared with the respondents. A total of 200 students participated in the survey. Both Male and female students were included in this research. Findings of the study show the Knowledge, Attitude and Practices existing among the students. Further an analysis was made of the findings. Recommendations to empower the students with knowledge and skill to curb this plastic pollution is also included in this research paper.

Keywords: Plastic, Pollution, Students, Environment

INTRODUCTION
Plastic is an inexpensive yet durable material which is globally used in day today life for food, clothing etc. It is also useful in commercial activities like transportation, telecommunication, and healthcare industries. However, plastic is considered non bio-degradable and is capable of destroying our ecology. Our nature has a feedback system. Therefore, as a result of the excessive interference in the natural course of the environment, the increased pollution has led to the disastrous consequences and after-effect like health hazards including carcinogenic diseases. The presence of plastic in municipal solid waste creates anaerobic conditions. It has been observed that plastic wastes have penetrated the ecological cycles leading to the biomagnifications causing cancerous diseases in not just in humans but also in plants and animals.

According to CPCB data, India generates around 15,342 tons of plastic waste per day (about 5.6 million tons yearly). In Delhi, around 690 tons of plastic waste is generated every day. Delhi’s share in contributing plastic waste is maximum. There have been multiple bans on plastic bags in Delhi. Despite ban by the NGT in 2017, plastic bags readily available &is being sold openly. The plastic bags, after getting thrown away, gets accumulated at landfill sites where plastic catches fire because of generation of methane gas. Further if thrown on the road it is consumed by stray animals. Around 90% of the plastic is getting disposed into oceans through river. Plastic materials are four of the top five pollutants in the ocean. UN report made a prediction that by 2050, there will be more plastic in oceans than fishes. Plastics bags thrown in the soil integrate to toxic metals such as cadmium and lead. This reaches into the ground water. Majority of the waste remain littered and is not collected. In colleges students use single use plastics such as PET bottles, caps, food wrappers and plastic bag produced by FMCG (Fast Moving Consumer Goods) companies. It is high time we rethink about our dependency on these single use plastics. After globalization the boom in the FMCG sector opened up the economy to different companies who are using plastic in the packaging of their products.

World Environment Day is celebrated every year on 5th June,2018. India played global host to the World Environment Day 2018. The theme of the World Environment Day 2018 was “Beat plastic pollution”.

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On this occasion, the international bodies such as UN Environment, the International Maritime Organization, the UN Regional Seas Programme, the Food and Agriculture Organization etc., proposed set of measures on the management of plastic waste, especially marine debris.

Several measures have been taken to reduce the ill effects of plastic products. This include including recycling, ban on distribution of these products, and imposing fine. Landfilling, biodegradation and incineration are also used as an additional methods to curb plastic pollution. The National Green Tribunal has directed ban on less than 50-micron plastic carry bags in the NCT of Delhi and also directed the defaulters to pay Rs.5,000/- as environmental compensation. However, in spite of all these measures taken at individual, organizational and governmental level to address the problem of plastic pollution, menace of plastic pollution is increasing.

LITERATURE REVIEW

A study was conducted to assess knowledge, attitudes, and practices relating to plastic containers for food and drink among parents and health personnel. Around 100 parents and 100 health personnel participated. The result shows that there are no differences in knowledge, attitudes and practices relating to plastic containers between parents and health personnel. Even though, 80 percent of participants use packaging of plastic for food and drinks, their knowledge about methods of use of plastic is inadequate. The study concluded that the parents know about adverse health effects of plastic packaging, but lack the knowledge of the alternatives.

Another study was conducted to assess the Knowledge, Attitude and Practice of plastic use among the people residing at Tiruchirappalli Municipal Corporation, Tamil Nadu, India and to understand the relationship between the various socio demographic variables and KAP on Plastic Usage. The result of the study concluded that people are aware of plastic use. The result of knowledge and Practice was okay, however the Attitude of people did not give satisfactory result. There is a case for bringing about a transformation in the attitude of the people towards the use of plastic.

A cross-sectional survey was conducted to assess the knowledge, attitude and practices (KAPs) on solid waste management of undergraduate students. The result showed that the knowledge and attitude are at positive levels. However the practice component was not satisfactory. Inclusion of environmental education with guidance on solid waste management in the course structure of undergraduate studies was recommended. The objective was to promote awareness on the issues of environment.

Environment education plays an important role. A case study was conducted amongst the elementary school students to evaluate their knowledge of solid waste management and knowledge about the environment. It was found that the knowledge of the students about the waste management was limited. Further an educational programme on environment was conducted for the students. The result revealed that more than 90 percent of the students wanted to understand the activities related to waste management. After the educational programme, most of the students achieved awareness about the eco-bags and understood that plastic bags are difficult to decompose naturally.

To understand the knowledge and attitude about plastic pollution among the students of a school, a cross-sectional study was conducted at Sharjah city. The finding shows that maximum number of students knew that the plastic wastes are harmful for environment. It was also found that the students, whose mothers had more idea about the environmental ethics, had better knowledge about environmental issues. Recommendation made to address this issue included requirement of governmental support and provision of environmental education.

The finding of one of the thesis concluded that the plastic production and consumption has increased worldwide. This is having negative impact on the global environment as disposed plastic products ultimately become waste and create all type of pollutions. Raman Sharma & Sharma opined that human beings should be blamed for the misuse of the plastic products and not the plastic itself. Several studies have identified the ill effects of plastic use which include destruction of the nature, morbidity and mortality of animals and ocean creatures. The process of production of plastic goods also leads to air pollution and global warming. Further because of improper disposal of plastic products after use, gets the sewerage systems blocked which leads to spread of infectious diseases.

Justification of the Study: All the stakeholders need to participate in protecting environmental degradation
from wanton use of plastic. Everyone has the solemn duty to preserve it. The new generation has added responsibility to protect our planet as they would be the future guard of the mother earth. Lack of research in this field has raised questions regarding the awareness about this issue and whether people want to reduce the use of plastic products.

The review of the studies conducted on this topic identifies the gap which is existing in the available literature. Very few studies have been conducted in the Indian context to assess the KAP of the college students, who can play a very important role in addressing the sociological issues related to plastic pollution. It is important to assess the knowledge, attitude and practice towards detrimental effects of plastic usage. Furthermore, this study can be used as for formulating plans by the governmental, non governmental organizations, and private organization. Subsequently, on the basis of the finding, a strategic intervention plan can be prepared to empower the coming generation to deal with the issue.

**METHODOLOGY**

A structured questionnaire was prepared to assess the KAP of students towards plastic pollution. The questionnaire was prepared to assess knowledge, attitudes and practices relating to use of plastic among students who were pursuing higher studies. The questionnaire was pilot-tested to check its validity with 15 students.

**Inclusion Criteria:** Only the college students residing in Delhi and NCR were included. Both male and female students were included.

**Exclusion Criteria:** Students living outside Delhi and NCR were excluded.

**Sources of Data:** A structured questionnaire was prepared and used to collect the primary sources of data. The secondary data included the articles, journals, books, research paper etc., for the research study.

**Tools for Data Collection:** The research used self-prepared structured questionnaire to study the profile of the students and their Knowledge, Attitude and Practice on plastic pollution. A Google Form was created and shared with the respondents. A total of 200 students participated in the survey. The questionnaire consists dimensions of Knowledge, Attitude and Practice.

In order to measure the level of Knowledge, Attitude and Practice on plastic usage, the researcher took help of the Excel software.

**FINDING**

A total of 200 people participated in the academic survey for better management of Plastic waste. There were 27.5% more females than males who responded. With less than 7.1% in their late twenties, the majority age group of 67.7% was aged between 20 to 25. The highest number of participants (25.3%) were teenagers. Almost all the respondents showed interest in taking initiative for rational use of plastic products. Out of the total sample space, 63.6% lived in nuclear families of less than 5 members; 32.5% members living in families of 5 to 10 members, With only 3.6% belonging to joint families. Around 57 percent were from undergraduate studies and around 44 percent students were currently pursuing post graduate studies.

To assess the knowledge level, the students were asked if they had any idea about the plastic waste. Around 30% students said that it was unwanted material leftover from human activity. 23.1% of the respondents were of the view that it was a source of recyclable materials. However the majority of the students (Around 48%) agreed that it was detrimental to human health.

Further to ascertain their understanding of the laws concerned, students were asked if they had knowledge of existence of any legislation banning the use of plastic bags in Delhi. Only 30% students confirmed that they were aware of laws whereas around 70% of them expressed ignorance about it. The National Green Tribunal prohibits the use of disposable plastic materials (cutlery, bags, cups and other forms of single use plastics) in the entire city. Delhi Government takes appropriate steps against storage, sale and use of such materials.

Around 90% of the respondents felt that using plastic water bottles, tiffin box, bags are injurious in the long run for humans while the remaining others did not support the same. Despite awareness about the detriment that plastic bags cause to terrestrial animals and marine life, around 32 percent of the respondents still use it. On the other hand, around 68% have been able to replace it with a better alternative.

Students were also asked if banning the use of plastic will be a welcome step. 94% respondents gave an
affirmative response whereas 6% held different views on the same as seen in the following.

Majority of the students also accepted that they are willing to contribute in reducing the consumption of the plastic bags and consented that they would prefer using cloth bag instead of plastic bag.

Looking into the health hazard caused by plastic bags, it was evident that people believe that plastic bags contributed to cancerous diseases, while many of the remaining responses considered air borne diseases as one of the health hazards caused by the plastic bags. Surprisingly, in the present study, there was a split response on the question if the plastic is recyclable. Around 58% think that it is while around 43% maintain that becomes useless.

Students were asked about the reason of using the plastic bags. Around 13% of the respondents said that they use plastic products because they are freely made available to them by the shopkeepers. Around 18% also felt that plastic bags are easily available. 16% of the total respondents said that they do not have any other alternative, so they end up using these plastic bags. Around 50% of the students said that they use plastic bags for reasons such as easy availability at low price or even at no extra cost, light weight, lack of alternative and durability.

Regarding removal of household waste and taking to the waste collection dump, around 11% said it was the duty of the Local Government and 9% said that it was the obligation of the household members, whereas remaining 81% of the total responses considered it as dual responsibility of both the local Government and the people in general.

Students were asked about the onus of accountability to stop or reduce the utilization of the plastic bags. 76% of the total respondents consider it to be the obligation of the community, while 16% feel it to be the responsibility of the government. Remaining students consider NGOs, environment agencies and the civic bodies responsible for the same. Students were further asked how they intended to reduce household plastic use. Around 77% of the respondents would prefer to carry their own bags to the market to limit the usage of plastics, whereas around 19% feel that it is better for them to use usable items to curb plastic usage.

There was a question about the disposal of the plastic product after use. It was found that about 52% of the total respondents say that they throw away the used plastics whereas around 43% prefer to reuse them in order to curb their proliferation. Rest of them suggested recycling the plastic waste.

From the survey, it can be seen that around 66% respondents think that the use of plastics is abetting whereas around 32% subscribe to contrary view. Further when questioned about the reluctance of the people to change their behaviors towards waste disposal many of the responses endorsed approach to awareness program through associative campaigns.

**ANALYSIS**

The above finding shows that the knowledge level about the plastic menace is discernible among the students. They are aware that indiscriminate consumption of plastic would promote many diseases which would harm the environment and its inhabitants. Majority of them appreciate that there is proliferation of plastic in daytoday life. This is a matter of great concern and there is a need to restrict its use for maintaining and sustaining the quality of our planet.

The objective of this research was to check how much understanding students have about the plastic bags and their harmful effects to them and to the environment. It has been seen in the majority of the responses that people are aware of the plastics products and their impacts to the surroundings. Many of them are even eager to take up initiative to overcome this issue by handling their plastic waste on their own in communities. Yet, it has been also observed that still most of the people are throwing away their plastic bags and bottles after use. There are two major reasons why people, after being aware of the harmful hazards of plastic products, are still doing it. Students responded that in our country, plastic products are easily available and at times, they are given away for free. Moreover, there are legislation in our law that prohibits the usage of the plastics, yet they have not been properly implemented by the government bodies. Because of these two reasons people are mishandling plastic product even after knowing the fact that it causes the deadliest effects to their health and to the ecological systems at different levels. This research concludes that the students are in the dire need to understand about the legislations and health hazards of the plastics products.
Moreover, there is a need of awareness programs which should be conducted to help students understand the different ways to handle, reuse and recycle plastic wastes and how these wastes are affecting marine life. The finding of the study shows that they lack idea about disposing it. There is a need to make students aware about the improper plastic uses and their knowledge level about purchase and use of plastic products for eatables drinks should be enhanced, especially of the students who in future would run their own household. Majority of the students also accepted that they are willing to contribute in reducing the consumption of the plastic bags and consented that they would prefer using cloth bag instead of plastic bag. Government should force shopkeepers to stop giving goods in plastics bags to consumers and provide cloth bag if the customer is willing to purchase. If this is practiced for some time, it would get into the habit of both seller and buyer. There is need to nurture and encourage this habit. Further students should be made to understand that beating plastic pollution cannot be the task of Government or NGOs alone. All the stakeholders have to pitch in to address this issue.

However, more research should be initiated to find out the actual effects on health from these chemicals.

**RECOMMENDATIONS**

**Online Campaign:** Students should be encouraged to join the flagship campaign of United Nations Environment Programme (UNEP) on internet. They should be motivated, inspired and educated to act for responsible consumption of plastics. Campaign should be initiated with the help of students to address the source of the problem.

**Responsibility of the manufacturers and distributor of plastic products:** Students along with their teaching faculties can give a representation to the government to make it mandatory for the manufacturers of plastics to join the “cleaning up” process. They can reduce production of unnecessary plastics, design the plastics which are less harmful and develop recycling process. Students can make a proposal to the shopkeepers that they must force their customers to pay for the bag. In Ireland this practice led to dramatic decrease in the use of plastic bags. Students can help in uniting citizens and groups in identifying top corporate polluters and urge them to take responsibility for the trash they produce.

**Green Good Behavior:** Green Good Behavior should be inculcated by teaching faculties with the help of class room teaching, case study presentation, conferences and seminars. They should be encouraged to take small steps like help change in behavior. Several workshops and thematic session should be initiated. They should be made to understand that they have enormous power as consumers. Students should be empowered with the knowledge that in their house they should cultivate the practice of segregation of waste which would ensure effective recycling.

**Environmental Education:** Education can disseminate knowledge and help in forming and changing attitude. A mandatory paper on environment and its associated problems should be prescribed in undergraduate & postgraduate courses. Educators must discuss environmental issues in the classroom. Social values and attitudes, in harmony with environment quality, should be inculcated. World Bank has given some advisories with regard to environment education, which should be the focus of environmental teaching. Further the teaching should not be confined to the classroom only. Apart from theoretical knowledge, they should be taken for field visit. Waste management lessons should be incorporated in environment education programme. Students should be motivated to avoid use of waste types of plastic, that is the kind that is used for a few minutes or seconds and then discarded. Successful case studies should be shared with students, for example the initiative of lawyer Afraj Shah, success stories of countries like Kenya and Panama (they banned plastic bags).

**RESEARCH**

Students should be encouraged to do more research on this issue. They can gain practical experience through laboratory experiments, field visits, data gathering and analysis. The effort should be to help them gain experimental learning.

**Legal Awareness:** Orientation Programme must be conducted to let students know about the existing government programme and policies to curb plastic menace. Legal provision should also be part of the orientation programme. Also, students can send representation to the government functionaries to implement plastic ban strictly. Poor implementation of the ban has earlier resulted in return of plastic bags to the
Rules related to Plastic Ban, Waste Management Rules 2016, which had introduced “extended producer responsibility”, ban by NGT, penal fine, the fine amount, NGT order which prohibits non-biodegradable plastic bags thinner than 50 microns in thickness etc., should be made known to the students. They should be made aware that on 10th July 2017, National Green Tribunal directed ban on less than 50 micron plastic carry bags in the NCR of Delhi. The defaulters will have to pay Rs.5,000/- as environment compensation.

**Volunteering task:** Students should be motivated to take up the volunteering task of cleaning up the river side & local beaches.

**Information Gap should be filled:** Students have no clue as to how to dispose the collected plastic. They should be provided this information with the help of organizations which are addressing these issues.

**Sign Petition:** Students should sign petitions so that companies take responsibility of the products & packaging and the onus of dealing with the plastic waste they produce.

**College Canteen:** Discussion should be organized in the college and students should be made to understand that the used plastic glass, plate, packet, straw etc., are major sources of waste pollution & environmental hazard. In the college canteen, these plastic goods should be provided only when it is asked for it. Campaign should be initiated to cut the use of plastics in the college canteens and restaurants. They should be encouraged to nurture the habit of avoiding use of single use disposable plastics. They should be motivated to carry their own water bottle. This would reduce use of PET bottle waste.

**Pledge:** College authorities should urge the students, faculties and office staff to reaffirm their commitment to a cleaner and sustainable planet and to pledge their commitment against the pollution created by plastic.

**Using Social Media:** Generally students are very active on social media like Facebook, Twitter, Instagram etc. But they hardly visit any environmental website. So online awareness will have more impact, if it is done with the help of social media rather than running blogs and websites. Experts can take help of social media to motivate students to protect environment by saying no to plastic use. Further an online platform should be provided to the students who can share innovative ideas to address this issue.

**Empowering School Students:** Students with the help of their teaching faculties can send representation to government to bring the Plastic and Recycling Curriculum in every School. A specific program should be developed to educate students about ill effects of plastic. They should be helped in gaining an understanding that resources should be used in such a way that it does not damage the environment. An initiative should be undertaken to make them understand of the threats faced by organisms, including endangered species. They should be encouraged to take the responsibility of reducing plastic pollution and in recycling to save environment.

**Celebration of World Environment Day:** This year’s World Environment Day provided an opportunity to learn many ways which could help reduce plastic pollution around the world. Students can be motivated to stop using plastic straws, to bring their own coffee mug to canteen, shopping bags to the supermarket, ask food suppliers to use non-plastic packing, refuse plastic cutlery. They should be encouraged to pick up any plastic which they find on street or on a beach.

**Trash Audit:** Students should be facilitated to conduct a trash audit for the college where they are studying. An accurate calculations can be made by them with regards to the waste generated by different departments, canteen, restaurant and food joints etc in the college. In terms of plastic pollution, the trash audit can discover how much students, faculties, office staff and people visiting canteen use pieces of single-use plastics on daily basis and throw it away. These findings can be used to suggest the authorities the necessary needed action. Further faculty can work with the students to create a Public Service Announcement to persuade everybody in the college to reduce single use plastic consumption.

**Group Projects:** Teaching faculties can assign group projects to students. Some of these projects could be:

a. School assemblies to be utilized to talk about plastic menace.

b. Preparing pamphlets and banners to spread awareness.

c. Organise intercollege art exhibitions.

d. Conducting quiz on environmental issues.
CONCLUSION

With the help of above mentioned initiatives, an environmentally literate generation of students could be created who would help in addressing the environmental issues like plastic pollution. The findings of the study shows that the knowledge level of the respondents is above average. The challenge is to translate the knowledge to practice so that they are able to reuse, recycle, repurpose and reduce plastic products. There is a need to discuss the socio-political-economic determinants of environmental problems unambiguously with the students, so that they have an idea about the intensity of the problem and social situation. Stakeholders like educationist, policy makers, environmentalist, NGOs, lawyers can join hands to channelize environment education in school and colleges from immediate environmental issues to national & global problems as the child grows. Further with the awareness generation & participation at public level and with proper implementation of law & legislation, the issue of plastic pollution can be checked to a great extent.

Students have to understand that they should not inflict damage to their environment which they cannot renew. All good things start with education and information powered by campaigns at personal, community, national and international level. Legislation also comes to our succor. During March 2016, the Union Government notified a new rule called the ‘Plastic waste management rules 2016’. This allows manufacture and use of polythene carry bags, plastic sheets, plastic packaging etc having thickness greater than 50 microns. If the desired results are not forthcoming spontaneously, there is no way out but to enforce the legislation through penal action. Notwithstanding compliance to the thickness criteria, there is no rationale behind the use of plastic cutlery, cups, straws and water bottles in restaurants, hotels, public or private functions and meetings. Other thrust areas include dispensing with the use of plastic for visiting cards, packaging for magazines and seat covers for motor vehicles on sale. For decades the nondescript socially marginalized waste pickers have been performing what is primarily the job of the citizenry and the civic bodies. Braving stench and deadly germs without any basic protection, they pick up recyclables from the non-biodegradable waste. They prove to be the greatest warriors against plastic pollution. Their services need recognition by enjoining the generators to segregate garbage at the source and handing over daily discards in separate stacks to the waste pickers. These friends of environment should be registered, provided with better working condition and paid reasonable honorarium.

India has a very large number of citizens who are in the age group of 10 to 24-year. If these number of individuals are empowered with knowledge about the plastic pollution and they bring it into their attitude and practice, the fight against plastic pollution can be easily won. All efforts should be made in this direction. The plastics are still too valuable to be simply thrown away. They can be recycled back into new products or used for energy recovery rather than littering it on road or allowing it to reach the landfill or water bodies.

Ethical Clearance: Nil.

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An Efficient Approach for Real-Time Traffic Control for Ambulance Service with Patient Health Monitoring System

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ABSTRACT

The proposed framework has executed the Knowledge of improving the traffic system in our country. As days are been passing, the country population is also increasing. The motivation behind this technology is to improve the traffic control and utilizing information recorded by movement of motorways using IR sensor. In addition to this work we are improved emergency vehicles like ambulance and fire engine are given priority to clear the traffic first. System is made more productive with expansion knowledge in terms of sensors and cloud services. Traffic is been controlled based on the sensor density and corresponding results is been recorded in the cloud service. In the event that there is a high traffic, clear the vehicles in a substitute route by the utilization of priority based sensor and furthermore broaden the signal time if there should be an occurrence of emergency. This system likewise give the arrangement to decrease the traffic level by altruistic the ready SMS to the closest traffic control station. In view of the traffic level, if there is any shot, the traffic controller coordinates the vehicles towards the way which has the less traffic.

Keywords: Sensors, Cloud services, IR sensor, IoT, GSM

INTRODUCTION

In this new era, population is increased in a country and traffic controlling is became the major drawback in terms of technology [2,4]. Even though there is no traffic the vehicle are being given Green signal and where there is traffic there you can see Red signal. This scenario is happening because of the automatic timers installed in the traffic post [1]. If there is too much of traffic then traffic controller comes to the road and operates the traffic manually. In this scenario it is more difficult for the emergency services like ambulance to travel in this conjugated area [6]. Various Techniques have been involved in this controlling the traffic but, it ends up with a operating manually in the most of the area. Due to this we can’t predict the travelling time of ambulance to reach the destination. In this scenario we can’t able to check the scenario of the Patient heartbeat [3].

In this paper, we have come up with a low cost and effective technology based on the vehicle density. We are implementing IR sensor at the traffic zones to calculate the vehicles for particular area from the traffic post. By defining the threshold value we can able to control the traffic based on the density. The side which is having more than threshold value are going to clear the traffic first and the side with low density are going to clear next. There can a scenario that two sides will have a same density count; at that point we are going to priority as first in first out scenario [5]. If the ambulance is appear at the low density area which is having Red signal, then the priority is been given to the emergency service and remaining all sides of the traffic will be hold till ambulance crosses that zone.

PROPOSED SYSTEM

The Proposed system which comes up with a new technology by utilizing the IR sensors and to control the ambulance, we are going with RFID. By this system we can able to measure a heart rate and we can frequently monitor the health condition of the patient. By using all those sensors we can able to improve our traffic system as well as the emergency service. In the server room, the user can able to monitor all the movement of the vehicle in real time.

SYSTEM DESIGN

This work consists of 3 sections . The are Ambulance unit, traffic signal selection and hospital unit. The design
is easy to understand and simple process. In the 4 way junction road, the sensors are been installed. Figure 2 shows the flow of the ambulance unit. The sensors will keep on track the objects moving through sensors. The recorded information is been passed through Internet of things (IoT) to monitor manually. Sensor is been installed according to Priority as first in first out. Here the priority is mainly depend on the emergency service and then to the public services.

RFID is been placed on Emergency services to improve movement of the service from the particular distance from the sensor. To track the patient status we are going to implement the heart rate sensor in patient and the status of the patent can be uploaded frequently on the hospital unit. With the help of GSM we can send the status of the patient and ambulance location through SMS.

Microcontroller is used to control the information which is obtained from the sensors and cloud services. The Corresponding output can be viewed through LCD display which is interfaced with LED or in the web server in hospital unit.

**MECHANICAL SPECIFICATION**

**Arduino Uno:** The Arduino Uno board is outfitted with sets of analog as well as digital (I/O) pins that might be interfaced to different extension boards and other circuits. The board highlights 6 Analog pins and 14 Digital pins. Figure 4 shows the specification of the arduino UNO. It is programmable with the Arduino IDE through a type B USB cable. Arduino Uno acknowledges voltages somewhere in the range of 7 and 20 volts.
friendly programming language and power consumption is less compared to all boards. Power can be given either by external or USB. Out of 14 digital pins, 6 are PWM pins.

Heart Rate Sensor

The Pulse Sensor can be associated with Arduino, or connected to a breadboard. The front of the sensor is the truly agree with the Heart logo. This is the side that reaches the skin. On the front you see a little round gap, which is the place the LED radiates through from the back, and there is likewise a little square simply under the LED. The square is a surrounding light sensor, precisely like the one utilized in cell phones and tablets, to modify the screen brightness in various light conditions. The LED sparkles light into the fingertip and sensor peruses the light that bobs back. The back of the sensor is the place whatever remains of the parts are mounted.

Internet of Things (IoT): The Internet of Things (IoT) is the Internet reached out into the physical world. Its work is to gather information and change it into helpful information. Its reason for existing is to enhance Products, services and companies by making value, operational productivity, resource use and innovation. It is the premise of computerized change when connected to the products, services and tasks of physically-based organizations. Figure 5 shows the basic representation of the Internet of Things.

The IoT enables articles to be detected or controlled remotely over existing network system, making open doors for more straightforward coordination of the physical world into PC based system, and bringing about enhanced effectiveness, precision and monetary advantage not withstanding diminished human intercession.

GSM and GPS: With the help of GSM we can able to send the message to the hospital unit to know the status of ambulance and patent’s heart rate. GPS is utilized with Arduino to track ambulance motion. Both services have been interfaced with Arduino Uno.

RESULTS AND DISCUSSION

IR sensors are been used at the end of each road. It is been interfaced with the microcontroller. The motto of the sensor is to count the vehicles are crossing on the road. We are going to fix the threshold value for low, medium and high density. The recorded values are been passed to the cloud server and it checks with the previous value whether it reached the threshold value or not. Based upon that density we are going to operate the traffic signals. If ambulance is passing on the low density area then we are going to give priority to the emergency service by clearing that path. Once that path is cleared then the old process will resume. The corresponding output can be viewed from the microcontroller which is connected with IoT. Every readings are been recorded in the web server as shown in Figure 5 and Figure 6.

CONCLUSION

Human life is valuable and must take after safety measures extremely conscious in all viewpoints this obviously incorporates ambulances services as well. In this, by utilizing smart emergency vehicle system we can accomplish the continuous service of the traffic control system by actualizing the substitute methods for signal change to permit flow control. The precision of the RFID is more than Camera’s so our paper too enhances the execution of traffic light System. This work is low cost effective, numerous utilization and deployed utilizing IoT, which is more efficient.
This work also reduces the accidents which are occurring frequently at the traffic signal junction due to the vehicle which are in hurry to leave the way for ambulance services. With the help of heart rate sensors we can calculate the pulses and communicated through IoT. So, in order to assist the public in better manner this lifeline project must be actualized in the traffic zones.

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**REFERENCES**


Analysis and Design of Single Stage Modified Z Source Inverter in PV System Using MATLAB

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ABSTRACT

This paper presents the PV based enhanced single stage modified Z Source Inverter applied to various applications. In the recent era, Z Source Inverter is improving. And the modified Z Source Inverter is developed from traditional Z Source Inverter. It has two configurations are continuous input current and discontinuous inputs current. Similarly, improved ZSI’s also have high output voltage gain at the shoot-through state and high modulation index. In order to enhance ZSI’s provides an increase in output voltage. These proposed inverters compared with conventional enhanced-boost ZSIs, ZSI, SL-ZSI, qZSI. The proposed inverters have a high modulation index, high boost factor. The stress across the capacitor is reduced, overcomes the problem occurs in the circuit are starting inrush current, input current ripple can also be negligible. Analysis, the design of enhanced-boost modified Z-Source Inverter with a simple boost PWM technique and LC network. The study can finish, and it can validate in simulation results through MATLAB/SIMULINK tools.

Keywords: Z-source inverter, PWM, inrush current, boost factor, voltage gain inversion, shoot through state ratio.

INTRODUCTION

In generally, PV has the most promising technology because its low cost, low weight their no moving parts to produce noise and pollution, highly flexible and easy to install. It reduces the requirement of fuel, coal to generate the power to consume efficiently. PV has been considered for voltage source fed modified Z Source Inverter[1-3]. To extract maximum power from the PV panel using MPPT (Maximum Power Point Tracking) controller technique is preferred. This MPPT method is commonly used in PV applications to extract the maximum power from the solar panel [4-5]. The main reason for using renewable energy resources are reduced maintenance cost, enhanced output voltage effectively. And it provides energy entire day and excess energy stored in the battery, during night time stored energy in the battery will retrieve and to should use. Due to this reason, PV can commonly prefer for all application[6-9].

The single stage power conversions like AC-DC, DC-AC converter, are replaced by a perspective inverter. The buck or boost mode of operation can perform by traditional current source inverter, voltage source inverter and AC output voltage in conventional inverters requires additional passive elements between the supply and inverter side. Addition of passive components in circuit leads to a short circuit of the device. Z-Source Inverter (ZSI) has suitable for rectifying above circuit damage. The passive elements are connected between source and output side. The ZSI consist of two states shoot through state and non-shoot through the state. In the shoot-through state, [10-11] of ZSI saves the energy. In the non-shoot through state, the power in the inductors is fed to the dc-link and boosts the voltage gain of the inverter which eliminates the short circuit and to improve the reliability. Even though ZSI has some disadvantages at the starting condition voltage does not transfer from source to the ground, discontinuous input current and high inrush current. Due to the above problem, and reduce that effects to further step the researches move a modified ZSI [12-13] with that small variation in traditional ZSI. It increases voltage factor of the system, reduced voltage stress across capacitors and to provide continuous input current and reduces the starting inrush current, shares voltage from source to the common ground that can overcome the starting inrush current problem. Furthermore, the current ripple is zero and to provide effective switching frequency. Simulation results will complete, after the analysis of theoretical.
PROPOSED METHODOLOGY

This proposed topology consists of PV source, modified Z-Source Inverter, three-phase inverter with the Pulse Width Modulation technique and then R load. The DC voltage source may be a battery, fuel cell stack, and PV panel. PV source is used because it has less maintenance and there is no fuel requirement. DC source from the Photovoltaic panel is fed to the modified Z-Source Inverter. Modified ZSI used due to it has a high boosting factor, high output voltage gain. That increased voltage could be fed to the three-phase inverter, and the inverter switches can turn ON/OFF by using PWM technique. The output voltage from the voltage source inverter supplied to the load. During state 0, the switch S is ON, at that time D1, D2, D3, and D4 are OFF, and capacitors discharge the energy to inductors in a network. During state 1, switch S is OFF, while diodes D1, D2, D3, and D4 are turned ON. And the source and inductors transfer the energy to capacitors and R load. Proposed block diagram of a single-stage modified inverter shown in Figure1.

MODELING

Photovoltaic panel: The function of a Photovoltaic panel is to converts the sunlight into the electrical energy by the PV effect. The photovoltaic panel consists of some cells which are connected in series to form a single unit. Because it has following advantages like no fuel cost, require less maintenance, and there are no moving parts. Due to its advantage PV widely increased in the generation of power. Figure2. Show the single diode model of PV panel. The current obtained from the photovoltaic module is given in equation 1.

\[ I = I_L - I_D \]  \hspace{1cm} \text{...(1)}

Z Source Inverter: Z-Source Inverter can replace by traditional Voltage Source Inverter (VSI), Current Source Inverter (CSI). ZSI is a power conversion topology that can operate in buck and boost mode with passive components. It uses the LC impedance network which provides increased voltage. This increased voltage cannot obtain in the conventional inverter. The traditional inverter may lead to severe damage to the inverter circuit. Circuit diagram of Z Source Inverter shows Figure3. The voltage gain of the modified Z-Source Inverter given in equation

\[ (M = 1/(1-4Ds)) \]  \hspace{1cm} \text{...(1)}

Modified Z Source Inverter: The high output voltage gain with a low input voltage is the main feature of this modified Z Source inverter which is suitable for PV application, Grid application, and Residential application. By using the modified Z source inverter has to provide effective switching frequency. Here, three-level modified ZSI with three-phase voltage source inverter is proposed. Figure4. Show the circuit model of the modified Z Source Inverter.
RESULT ANALYSIS

The proposed single stage Modified Z Source Inverter with PV system implemented. And the overall simulation circuit of Modified Z Source Inverter with and without filter circuit shows in Figure 5. Figure 6. Show the Modified Z Source Inverter output is around 170V. Figure 7. Show Three-Phase Inverter voltage without filter circuit is around 1000V. The overall output waveform of Three-Phase Inverter with a filter circuit with 110V shown in Figure 8.

![Figure 5: Simulation diagram of Single stage Modified Z Source Inverter](image1)

![Figure 6: Modified Z source inverter output voltage](image2)

![Figure 7: Three-phase inverter voltage without filter circuit](image3)
CONCLUSION

Enhanced single stage Modified Z source inverter for PV system with high voltage gain is proposed using MATLAB/SIMULINK. This proposed inverters compared with conventional enhanced-boost ZSIs, ZSI, SL-ZSI, qZSI. The proposed inverters have a high modulation index, high boost factor with the low shoot-through ratio. The stress across the capacitors is low it overcomes the drawback of starting inrush current, input current ripple that will occur in the system can also be mitigated. In order to reduce the capacitor stress, it leads to boost the voltage at a high level. The simulation results for the modified Z source inverter is about 170V from 12V of PV input voltage. Design and modeling of a modified Z source inverter using with and without filter are analyzed in this paper.

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REFERENCE


Classification of a MRI Brain Image Using Genetic Algorithm for KNN Classifier

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ABSTRACT
The classification of brain images divided into two types normal or abnormal based on the abnormality detection. In this method, the Magnetic Resonance Imaging (MRI) brain classification done by three phases such as preprocessing, feature extraction and classification. The preprocessing step is used for removing noise in the image for the feature extraction process. In this method, Genetic Algorithm (GA) and K-Nearest Neighbour (KNN) classifier is used for the classification of MRI brain image. The GA has better accuracy for the classification results. Then KNN classifier use confusion matrix computed and shows the higher accuracy than the support vector machine classifier. The performance of this method is calculated by the GA and KNN, whether the image is normal or abnormal.

Keywords: Classification; Magnetic Resonance Imaging (MRI); Genetic Algorithm (GA); K-Nearest Neighbour (KNN).

INTRODUCTION
Comparison of machine learning methods is discussed in [1] for multiple sclerosis detection entropy-based stationary wavelet. The majority vote of k neighbors assigned to the new instance of an image and KNN gives the better classification. Automated classification is discussed in [2] of brain images using biogeography-based optimization and wavelet-energy. Automatic classification of MRI images shows the normal or abnormal image and used for classification of the image with many types of disease status and pathological condition. Magnetic resonance brain classification is discussed in [3] by a time-varying acceleration coefficients and mutation with a swarm optimization of a novel binary particle. The optimal feature combination shows the better ranking of MRI brain classifiers. An intelligent and automated medical decision is discussed in [4] in support system brain for MRI classification of scans. It has an impressive generalization capability of which various diseases work on the different dataset. The real-time diagnosis challenges easily meet with the health care system. A survey is discussed in [5] on MRI brain images for the detection of brain tumor. To compare this technique the computational time is considered. Accuracy and reliability are assigned because they are much more important because the diagnosis tumor is a sensitive task and complicated.

MRI brain cancer classification is discussed in [6] using a support vector machine. The MRI images from the tumor regions are extracted by the features. By measuring the favorable properties, the original data is reduced by the feature extraction, the one input sample from other sample discriminate against each other. Review is discussed in [7] of MRI image classification techniques. The state of the art methods is an integrated report for the classification of images and automated analysis. The method has the higher performances. A review is discussed in [8] on brain MRI images in various brain tumor detection. K-Nearest Neighbors used to vote the distance (Euclidian Distance) function is based on the KNN algorithm. The Euclidian distance metric used, compared to other classifiers KNN gives the higher accuracy.

Computer-aided diagnosis of human brain is discussed in [9] through MRI: A new algorithm and survey. The medical imaging and diagnostic radiology are the primary research subjects in it. To determine the generalization of the result, the weaknesses of the generalization overcome by the other machine learning techniques. Classifying brain anomalies is discussed in [10] using PCA and SVM.
In different pathological conditions type and disease status is used for the classification of images with automated analysis. Automatic medical image is discussed in [11] is classified and abnormality detected by using the K-Nearest Neighbour. Comparing with KNN, the SVM has the higher accuracy. KNN is a simple classifier, where each pixel classified in the same class. Segmentation & Classification is discussed in [12] Of MR Images of Brain Tissue Using IFCM & K-NN Algorithm.

The brain MRI based on the region of KNN classification. Some features are extracted by the parameters of the suspected area. Magnetic resonance is discussed in [13] in an improved artificial bee colony algorithm for image classification. Regarding the accuracy of classification, the supervised classification is better than the unsupervised classification. A hybrid classification method is discussed in [14] of genetic algorithm, Bayesian methods and k nearest neighbor. The supervised learning based on KNN. The existing training data appeared to find the closest k sample. Analysis of different wavelets is discussed in [15] for brain image classification using support vector machine. The classification method is done by the classifier by using various classifiers to check it is normal or abnormal.

Microarray data classification is discussed in [16] using dual-tree m-band wavelet features. The KNN is widely used in the wavelet transform it classifies the array of data in it. Object recognition is discussed in [17] based on LBP and discrete wavelet transform. The KNN also used in the object recognition it separates the images from the database and classifies it. Figure 1 (a) shows the normal brain image (b) shows the abnormal brain image.

**MATERIALS AND METHOD**

The proposed system has the classification of MRI brain images for the genetic algorithm, and the KNN classifier performs it. In this method, we use a preprocessing step to decompose the image and then to extract the feature extraction to show the better result. Then the features are selected by the GA to choose the elements for classification. This shows the clear classification accuracy. The classification is done by the KNN classifier which gives the accurate result. The KNN classifier shows the better result when compared to other classifiers. The accuracy, sensitivity and specificity values are evaluated by the performance measure.

**RESULTS AND DISCUSSION**

This method was done by a set of normal and abnormal brain images. The decomposition is made by preprocessing to get the denoised image. The features selected by the GA method the desired characteristics are selected from the extracted features. The classification is done by the KNN classifier; it gives the high accuracy output from the other classifiers. The result shows that the given input is normal or abnormal. Figure 2 shows the work flow of MRI classification system.

**CONCLUSION**

In this method classification of MRI brain image using GA is implemented by KNN classifier. The input images are denoised by the preprocessing technique. The feature extraction is done by the denoised image, then use GA to extract the feature for the desired characteristics. Then the classification is done by the KNN classifier which gives the apparent result. Our proposed system provides the higher accuracy for the classification results.
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Color Transfer of an Image in Texture Decomposition using Demosaicing Algorithm

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ABSTRACT

Color transfer is a technique which can borrow one image’s color characteristics from another model. The quick removals of a specified target image have multiple numbers of color palette with creative effects. To reconstruct the functions with structure and texture filling algorithm separately, then decompose the image into a sum of two functions with essential characteristics. Demosaicing algorithm is used to allocate color channels for each pixel. Color Filter Array (CFA) used by demosaicing algorithm, which the color covered by image sensors. Only one single color component characterized by CFA in each pixel that is provided by Bayer CFA. The performance is calculated and confirms the usefulness of the method.

Keywords: Segmentation; Color transfer; Demosaicing; Color Filter Array (CFA).

INTRODUCTION

Progressive color transfer for images is discussed in [1] of arbitrary dynamic range. By the use of color palette, the several color transfer techniques used. Content-based is discussed in [2] integrating of color and texture features by image retrieval. The image database has the different texture features. Color transfer is discussed in [3] for correlated color space. Color correction techniques propose the kind of literature. Image cartoon-texture decomposition is discussed in [4], and the L1 functional regularized the total variation and feature selection. The dissolution of a real image into a sum of images and texture minimize the whole difference. Color image demosaicing is discussed in [5] using iterative residual interpolation. Both objective and subjective evaluation is done by the demosaicing algorithm.

Color modification estimation is discussed in [6] for CFA pattern change for digital images. The method of detecting contrast enhancement changes the color of digital images. Comparison is discussed in [7] of demosaicing color methods. The linear interpolation is obtained by the available by each component plane separately in the image plane. A new edge-adaptive discussed in [8] demosaicing algorithm use color filter arrays. To reduce the color frequency of channels, the image is reconstructed using the adaptive edge filter in the color-difference space.

Model of retinal local adaptation is discussed in [9] for mapping of color filter array tone of images. The CFA is not subject to artifacts with center or surrounded algorithm. A Framework is discussed in [10] for the applications of color filter array images is Denoising and Demosaicing. The noise observed by a color filter array which has low-complexity to perform CFA. Color demosaicing is discussed in [11] using the variance of color differences. The color a pixel locating on each sample is filled with colors and interpolating the missing colors in it.

Cost-effective color filter array is discussed in [12] demosaicing using spatial correlation. To reduce the visual artifacts, the edge detection in the neighbor pixels in the directional edge used. High-quality linear interpolation is discussed in [13] for demosaicing of Bayer-patterned color images. The complex non-linear filters occur in the Bayer filter array the color interpolation done for demosaicing method. Color texture is discussed in [14] classification by integrative co-occurrence matrices. The perspectives in the independent color textures have the color texture analysis and intensity for single and multi-channel co-occurrence. Figure 1 shows the (a) target input image and (b) shows the result output image.
MATERIALS AND METHOD

In our proposed system, new color transfer algorithms for the fabric images introduced. The image segmented into color decomposition and texture decomposition method. The texture features are reconstructed by the demosaicing algorithm. Then the algorithm uses CFA to fill the incomplete color samples. CFA uses a Bayer filter array for the configuration of CFA. It has alternating green, red and blue channels. The green light has the higher sensitivity to the human eye, so it occurs twice other than red and blue light. The algorithm provides the color for each pixel other than a single element. Then the algorithm reconstructs the full color of image with the incomplete color samples with the CFA. By using a demosaicing algorithm, the color transfer of an image has the apparent result. Figure 2 shows the workflow of color transfer in the image. Figure 3 shows the Bayer CFA.

RESULTS AND DISCUSSION

In our proposed approach the demosaicing algorithm is used for high color resolution. The input image is decomposed by the texture decomposition and color decomposition. Then the features are extracted by the texture features to get a clear result. Then the CFA filter is applied for the color assigned to each pixel. Then the result shows the target image and color transfer of the image accurately. Figure 4 (a) shows the original image and (b) shows the color transferred image.
CONCLUSION

The color transfer in an image using texture features with the demosaicing algorithm presented. This algorithm validates two things: distinguishing original pictures from the manipulated ones and accurately localizing the different colors of the image. The demosaicing algorithm assigns the color for each pixel by the use of CFA. This experiment gives the accurate result for the color transfer in the pictures.

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REFERENCE


Competitive and Fidelity Fixed Point Updatable FFT Processors of VLSI Design

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ABSTRACT

In communication system Fast Fourier Transform (FFT) performs a vital operation and competitive and fidelity fixed point updatable FFT processors of VLSI design has been proposed. Competitive and fidelity fixed point operation done by the use of CSLA (Carry Select Adder). The number of addition and multiplication operation has been performed by FFT algorithm. Mixed radix-3, 4 FFT has been proposed in this method and CSLA shrink the hardware consumption of the scheme and CSLA incorporated into pipelined SDF-SDC. In proposed method, carry select adder has been modified by reduced full adder circuit which provides reduction in slices, delay and power utilization. Number of logic gates utilization has been reduced in the full adder circuit. ModelSim 6.3C has been used to approximate the Simulation of projected competitive and fidelity fixed point updatable Radix-3, 4 SDF-SDC FFT using Carry Select Adder of VLSI design designs and Xilinx ISE10.1 design tool used to validate the performances.

Keywords: Single path Delay Commutator (SDC), Carry Select Adder (CSLA). Fast Fourier Transform (FFT), Single path Delay Feedback (SDF).

INTRODUCTION

In VLSI designs, the multipliers and adders are very power ravenous factors. Mechanism of time saving is determined by the fundamental principle of FFT. Original signal to frequency domain signal has been converted by the FFT analysis. FFT is used to execute different platforms such as computer chips and universal purpose processors. FFT perform the computation process by the use of divide and conquer techniques. This separates the N co-efficient into smaller blocks in various stages. Digital adder is a vital obligation in advanced digital processors for quicker computation. Adders in circuits attain more area and reduce power as great additions are completed in advanced systems. In ALU and DSP systems adder is one of the important blocks. Now, the carry select adder is replaced by CSLA. Pipelined radix-3, 4 SDF-SDC FFT using CSLA has been projected.

The projected design provides high performance than the existing memory based FFT design using dual-port memory.

Wang et al., [2] developed FFT/IFFT design for IEEE 802.11ad standard which provides high-throughput, reduced difficulty to the system. The mixed radix-2¹, 2², 2³ FFT designed to shrink the difficulty of twiddle factor. A single RAM collection has been achieved by the parallel normal-order output data. Generally, the complete FFT/IFFT design is elevated throughput and area competent, and the back-end simulation results illustrate that the core area of the FFT design is 1.69 mm² in Silterra 0.13 μm method.

Ramkumar, B. and Kittur [3] proposed carry select adder which perform fast arithmetic functions and it is used to decrease the area and power utilization in CSLA. Area and power has been reduced by easy and capable gate level variation. The modified 8, 16, 32 and 64 bit SQCSLA design and been proposed which compared with existing design. So, the projected architecture decreases the area and power.

Mohanty and Patel [4] explained the logic operations in usual CSLA and binary to excess-1 converter based CSLA has been analyzed. In proposed method all
redundant logic operation in usual CSLA has been eliminated. Projected carry select operation is planned before the computation of final sum. Optimized logic units are used to design an effective CSLA. Less area and delay has been achieved by the projected CSLA than conventional method. The ASIC synthesis result illustrates that the BEC-based SQRT-CSLA architecture involves 48% additional ADP and utilizes 50% extra energy than the projected SQRT-CSLA, on standard, for dissimilar bit-widths.

Garrido et al., [5] proposed a new 4096-point radix-4 memory based FFT which tracks a argument free plan. The proposed design needs a total memory of size N and a several extra multiplexers. The control is moreover easy, as it is produced openly from the bits of a counter. The FFT has been executed on a virtex-5 FPGA using slices. Distributed logic has been used to reduce the objectives and hardware executed in DSP48E.

Chen et al., [6] explained a hardware proficient mixed GHR reconfigurable FFT process which based on radix-25/16/9 uses a 2D factorization method as the elevated radix unit and 1-D factorization scheme. The 2-D factorization system is executed by an improved delay factor matrix design, which supports 25, 16, 9, 8, 5, 4, 3, and 2-point FFTs. Co-prime accessing technology is used to perform 1-D factorization. The speed-area ratio of the projected system is practically 2 times enhanced than that of prior FFT processors.

GMR DFTs having eight radices and 34 DFT lengths. Second, the radix size is as high as radix-25, which advance the processing speed and the hardware effectiveness. The processors having eight-parallel data pathway can attain a high throughput rate up to 27.5 GS/s at 430 MHz. Also, the processors can support any FFT size using additional stages. [7][8]

The principle of folding transformation to derive the architecture, which set off the idle period of arithmetic component in multipath delay feedback (MDF) architectures by integrating the decimation-in-time operations into the decimation-in-frequency-operated computing units [9]. The Use of an arbitrary radix, i.e., radix-\(r\), to execute the scheme. The scheme is not only applicable to radix-\(r\) FFT processors with one butterfly unit, but is also suitable for FFT processors with multiple butterfly units [10][11].

**Radix-3, 4 Algorithms:** Divide and conquer techniques are mainly used in Radix-3 algorithm and it decomposes an N point DFT into sequentially lesser DFTs. While the number of data points are power of 3, it is able to perform radix-3 algorithm. If the unique DFT size can factored down to 1 or more threes i.e., \(N=3^t\). The Figure 1 represents radix 3 fft with twiddle coefficients explanation.

![Figure 1: Radix-3 FFT](image1)

Reduced computational path has been achieved by the improved speed of functioning in radix-4 FFT algorithm. The power/ index reduced by the increased base. Radix-4 FFT the number of steps is decreased to 50% and it takes 4 inputs and outputs. The Figure 2 represents detailed diagram of radix 4 FFT. The smaller FFT outputs are reprocessed to compute several outputs; therefore the total computational price is significantly shrunked. The radix-4 FFTs necessitate 75% as several difficult multiplications as the radix-2 FFTs.

![Figure 2: Radix-4 FFT](image2)

**Proposed competitive and fidelity fixed point updatable Mixed Radix-3 and 4 SDF-SDC FFT using CSLA:** The proposed competitive and fidelity fixed point updatable Mixed Radix-3 and 4 SDF-SDC FFT using CSLA has been designed in this work. Figure 3 shows, The developed architecture of competitive and fidelity fixed point updatable mixed radix-3 and 4 SDF-SDC has fewer number of computational steps and enhance the performances of FFT processor. In VLSI design SDF-SDC have more benefits which are less area consumption, reduced power utilization and high speed.
CSLA (in Figure 5) is a specific mode to execute an adder which is a logic component that calculates the n+1 bit sum of two n bit numbers and it is faster than other adder. CSLA is used to shrink the area, power and delay of an FFT process. Figure 4, shows the pipelined radix 3,4 SDF-SDC FFT using CSLA.

RESULTS AND DISCUSSION

Verilog HDL is used to complete the projected competitive and fidelity fixed point updatable Radix-3, 4 SDF-SDC FFT using Carry Select Adder of VLSI design. ModelSim 6.3c has been used to estimate the simulation results and Xilinx ISE 10.1i used to evaluate Synthesis Performances. Figure 6 shows that the simulation results of projected competitive and fidelity fixed point updatable Radix-3, 4 SDF-SDC FFT using Carry Select Adder of VLSI design. Table I shows the comparison of existing Radix-2 SDF-SDC FFT and proposed Radix-3, 4 SDF-SDC FFT using CSLA. Figure 6 and Table I shows the Simulation result of 16-point radix-3, 4 SDF-SDC FFT using CSLA.
CONCLUSION

VLSI scheme is used to propose the competitive and fidelity fixed point updatable Radix-3, 4 SDF-SDC FFT using Carry Select Adder of VLSI design. Existing Full Adder has more number of gates than CSLA adder design. Performance of the CSLA superior by the use of reduced adders. The CSLA is integrated into Radix-3, 4 FFT and then the aim of this paper is to shrink the processing time and get better the speed of the FFT processor. Slices, LUTs, delay and power exploitation has been reduced by the proposed radix-3, 4 algorithms. Competitive and fidelity fixed point updatable Radix-3, 4 SDF-SDC FFT using Carry Select Adder of VLSI design gives 22.15% hardware slices, 24.62% alleviation in number of LUTs, and 51.24% reduction in delay and 93.64% alleviation in power consumption than the conventional Radix-2 SDF-SDC FFT.

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Design of a Child Theft Monitoring System Based on Motion Tracking Technology

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ABSTRACT

Safety of the children is always comes with a most priority issue when compared with other issue. When parents or guardians are absent the life of the children will be at risk. Hence the monitoring or alarming system for the children based on the image or video become necessary. In this article, vision based monitoring system is proposed with the motion tracking technology. The proposed system employed for easy monitoring and tracking of the children state of action. If the detected state is dangerous to the child then the system will take the necessary action to make the children in safe state. Hence the theft of the child can be prevented. A camera is connected with the raspberry pi for the video processing and obtaining the image of the dangerous state of children. Proposed System can recognize the motions of the children so that it can take proper actions. This monitoring and theft prevention method can be employed as a main care system for children because of the advantages like fast-response and low hardware cost.

Keywords: Camera, Raspberry pi, vision based monitoring system, motion tracking technology

INTRODUCTION

Now-a-days continuous monitoring of children becomes a hard job in reality [1]. There are no possible options for the parents to hold the children with them all the time especially at time of working. For non-stop monitoring of children when the parents are busy at home or busy with work station, hiring a care giver is an option [9]. The alternative solution for the continuous monitoring of the children is a daycare center [5]. The above methods are not suitable for many parents according to their demands. Another important case with the above methods are the parents are not sure about the children are in safety in both cases.

For this situation monitoring device for the children is the best way for removing the fear and stress of the parents [8]. Although several studies done on wireless communication based personal monitoring methods [2, 4]. Specific platforms are needed for this kind of methods. So this will make the system costly and also difficult for using the system [7]. This article sets to build up with the low cost and simple to use. Previous methods [3, 6] of monitoring are developed by utilizing either arduino or microcontroller. Child monitoring and the theft prevention is designed by using raspberry pi3.proposed method is based on the motion tracking technology using camera for monitoring child and RFID for preventing the theft of the children. These kinds of devices are developed for monitoring the activities of children and also actively alert children and guardians with possible security risks.

SYSTEM DEVELOPMENT

The primary objective of our proposed system is to monitor the child activities and preventing the theft of child in the hospital areas. The proposed system only allows the authorized people enter into the room where the child is present in the hospital. If any unauthorized persons try to enter into the ward where child is keeping alarm will turn on and alert the condition to the surrounding peoples.
Figure 1 shows the system architecture of child theft monitoring based on motion tracking technology. The monitoring details of the child and alert information also sent to cloud by using IoT. This will help the parents or guardians to view the conditions of their child at any place and at any time.

**Hardware Implementation:** Figure 2 shows the block diagram of the monitoring and theft prevention of the children using motion tracking technology. Hardware implementation of our system comprises of raspberry pi as a central processor or controller, input section of our system contains camera and RFID module and output section for our system consists of DC motor and buzzer.

**Camera:** Our proposed system uses high definition optical USB camera for the monitoring the child. Camera is connected to the Raspberry pi through USB communication. The main purpose of camera in our system is whenever an unauthenticated person tries to open the door in the ward where the child is kept. It will take the images of the person and send it to the cloud by using Wi-Fi. Captured images then send to the concerned people or authorities by means of E-mail.

**RFID Module:** Radio Frequency Identification (RFID) module contains reader and tag. The main need of RFID module in our system is to restrict the unknown person into the children ward in hospital. The authorized person will be provided with the tag. The tag contains the unique Id. The ID is already fetched into reader by using the raspberry pi through UART connection. Once the ID is matched the motor mechanism will run. If the ID from the tag is not matched then it will turn on the alarm unit.

**DC Motor:** DC Motor, due to its low cost it is employed for door mechanism in our proposed system so that the system could be cost effective. In the door mechanism, the motor will turn ON only when a person placed the authorized card otherwise it will be in OFF state.

**Alarm Unit:** Alarm unit in our system contain the buzzer. Once the device detects the unauthorized person in the ward of the children, the buzzer will get energized and alert the surrounding people about the state of the children.

**Raspberry pi 3:** Our proposed system uses the raspberry pi 3 model B because of the great advantage over the microcontroller. Raspberry Pi is a qualified small sized computer. Figure 3 shows the features of Raspberry pi 3. Raspberry pi acts as a central processor that monitors the process of camera and RFID module and then controlling the process of Door mechanism and alarm unit.
Raspberry Pi is provided with the inbuilt Wi-Fi unit, so it is very easy to connect with the IoT. The information about the child status is updated to the cloud server. Performance of our system is increased due to presence of Quad core 1.2 GHz Broadcom 64 bit CPU. Central processor has 1 GB RAM so the processing speed will be high compared with the other micro controller based system.

RESULTS AND DISCUSSION

When the authenticated user placed the tag on the reader the door mechanism will operate automatically and allowing them to see the children. But when the central processor detects the unauthenticated login then it will alert the people surrounding the ward and also through the IoT. Figure 4 shows the child theft monitoring using motion tracking technology. The movement of the unauthorized person has been captured and sends through the mail for the concerned authorities or parents or guardians.

![Figure 4: Child thefts monitoring using motion tracking technology](image)

CONCLUSION

In this article, designing the child theft monitoring and alert based on the motion tracking technology is proposed and process is carried out. The proposed system is a cost-effective because of the low hardware cost and high performance based system. Because of the use of raspberry pi 3 over the other controllers. The system continuously monitors the child state if there is any abnormal situation occurs then system will take the actions. The use of high definition camera helps in the accuracy of the system. Due to the evolution in the communication technology, our proposed system is implemented with the IoT. Details about the safety of the children can be viewed by the parents or guardians and also by the hospital management at any time through internet. This makes our system is the best method for the child theft monitoring.

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Design of Single Bus Cascaded H-Bridge Multilevel Inverter for PV Application

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ABSTRACT

The single bus cascaded H-bridge inverter (CHB) with DC-DC converter for improves the voltage gain using photovoltaic system. The multi input in H bridge inverter for decreasing the harmonics using single dc bus. The photovoltaic based boost converter for enhance the voltage gain and it is fed into various converter circuit which are connected in parallel. The proposed inverter has decreased the utilization of power switches and increases the efficiency. These single bus cascaded H bridge multilevel inverters used to reduce the Total harmonic distortion in switches when the levels increased and power quality of the photovoltaic system is also improved. The photovoltaic based single dc source connected with cascaded H-bridge inverter is implemented using the Matlab/Simulink tools.

Keywords: DC bus bar collector, Cascaded H-Bridge (CHB), multilevel inverter, Total Harmonic Distortion (THD), Grid.

INTRODUCTION

In electrical power system the multilevel inverter has one of the powers generating system and generates high gain with minimum harmonics. The multilevel inverter has applicable in renewable, machine drive, electrical vehicles etc. The inverter has lower harmonic, less voltage stress and mitigating electromagnetic interference [1-3]. The various multilevel inverters such as cascaded multilevel, diode clamped and flying capacitor inverter. The cascaded inverter has utilize numerous cell in single CHB based on photovoltaic system accomplish maximum power point tracking by regulating dc link voltage and improves the PV voltage [4-6]. The grid connected multilevel inverter has produce power as a result of unbalanced current.

The independent PV array connected to a single DC bus collector via DC-DC boost converters performing MPPT for each PV array [7]. The DC bus connected to multilevel inverter for AC load application. Inverter consists of cascaded H-bridge multilevel inverter. The specific operation of CHB, each H-bridge input must be fed by source [8]. A multi-string CHB inverter where per-cell and per-phase unbalanced powers eliminated by concentrating the whole PV generated power in a single DC bus has introduced. The generated dc power is controlled and fed into various converter circuits for H bridge inverter [9-10]. DC bus voltage is not directly connected to CHB cell voltages because the dc power is transferred via the dc bus bar collector and flyback converters, which improve the gain and reduce harmonics [11].

PROPOSED METHODOLOGY

The proposed methodology has combination of PV, converter and cascaded H-bridge inverter. The proposed circuit utilize PV has primary source and output is fed to the DC-DC converter for boosting purpose then it is connected to various dc-dc converter for supplying the multilevel inverter. The cascaded H-bridge inverter is fed into AC load. The inverter has to generate fewer harmonic and decrease the filter size due to high quality voltage waveform [12-13]. Figure 1. Represent the general block diagram of the single bus cascaded H-bridge multilevel inverter.

Figure 1: A proposed Block diagram of single bus cascaded H-bridge multilevel inverter for PV application
MODELING

Multilevel inverter: High power is used for many applications in recent. In that few appliances require low or medium or high voltage for their operation without any losses. The multilevel inverter needs to provide a high output power from the low voltage source. The sources are batteries, supercapacitors, and the solar panel is familiar voltage sources \[14\]. The multi-level inverter has several switches, and that arranged. The arrangement of several switches is significant. A multilevel inverter has three types such as diode clamped, flying capacitor and cascaded H bridge multilevel inverter.

Cascaded H-bridge: The cascaded H-bridge multilevel inverter has connected more similar H bridge cell in series form and has more dc source and reduction of transformer. This inverter utilizes switches, capacitors and it requires less number of components for each level. Both capacitors and switches pair combination called an H-bridge. H-bridge requires less number of elements compared to other multilevel inverter. H-bridge consists of cells, and each battery which can supply three different voltages (zero, positive, negative). Cascaded H-Bridge inverter shows in Figure 2.

![Cascaded H-Bridge multilevel inverter](image)

Figure 2: Cascaded H-Bridge multilevel inverter

Photovoltaic Cell: A radiation fall on the photovoltaic panel and perform movement of electrons thus by produce electricity. Photovoltaic (PV) generation has more advantage such as low fuel cost, less maintenance, and there are no moving parts. More PV cells are connected to generate module. Two or more modules are connected to form panel. A solar cell model is shown in Figure 3.

![Equivalent circuit of photovoltaic module](image)

Figure 3: Equivalent circuit of photovoltaic module

RESULT ANALYSIS

The single proposed bus cascaded H-bridge multilevel inverter for PV application based on increasing the voltage level is implemented, and it can prove in Matlab/Simulink. Figure 4 Shows the overall simulation circuit of single bus cascaded H-bridge multilevel inverter. The output voltage of DC-DC converter is shows in Figure 5.

![Overall simulation circuit of single bus cascaded H-bridge multilevel inverter](image)

Figure 4: Overall simulation circuit of single bus cascaded H-bridge multilevel inverter
The output voltage of seven level inverter is shown in Figure 6. The total harmonics distortion waveform of inverter is 9.73% shown in Figure 7.

**CONCLUSION**

The cascaded H bridge inverter has implemented in MATLAB/Simulink. The cascaded H bridge inverter has less weight and cost compared to other multilevel inverter. The multilevel has to reduce the distortion and improve the overall output of the system. The photovoltaic based multilevel inverter has generated input current and reduces switches. The proposed system has more control response and draw input current with less distortion compared to conventional method. The levels are increased in inverter system for decrease the harmonics and increase the voltage and current waveform.

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Designing a Flexible Device to Assist Visually Challenged People

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ABSTRACT

Several people have slowly lost a vision over years; on the other hand some people are blind from birth. People who advise that the blind have a little vision and may be sensitive to light, may be blurred vision, and also having a limited field of vision like side vision, central vision or can see only half of the view. Some visually impaired peoples may not come out any different from other peoples; other people use cane. Visually impaired people find difficulty in identifying detail or in reading. However, when the output vision is affected it can decrease the visual area and hence the mobility is mobility difficult. By using Raspberry pi along with camera module a progressive work is done for developing an aid for visually impaired, which will help them in Reading, face Recognition, GPS location detection and controlling home appliances.

Keywords: Raspberry pi, Camera, GPS, face recognition, Zigbee

INTRODUCTION

Visually impaired people come from various backgrounds. Many are elderly, some are young. Visually impaired people have much capability and can accomplish several things even with visual impairment or blindness, so they need to be valued and should greet assistance. The report from World Health Organization (WHO) states that there are 285 million visually-impaired people worldwide. Around 39 million people were blind in the world. Due to the evolution of technology in the medical field the diseases that cause blindness are decreased. However, the blind people over 60 years of age are rising by 2 million per decade. According to above states, those numbers which are estimated are twice by 2020. So the necessity for assistive devices for navigation and direction has increased. The easiest and the most reasonable navigations which are available are trained dogs and cane. Even though these assistive methods are popular, they could not provide all necessary information for the blind. So the vision based assistive system is proposed.

An optical RGB camera of VGA resolution is employed to capture the nearby scene and progress the captured frames to extract useful information for the user. The requirements of proposed has been defined based on a survey performed by our group to know the needs for visually impaired and also restrictions provided with accessible solutions. Aim is to tackle protection, and social problems related to the both outdoor and indoor mobility of visually impaired people, provision are obtained from the distinctive street environment of developing countries like India. Instead of rising new algorithms, development of the assistive device for visually impaired only requires existing image processing algorithms and changing it to attain the need of the device. Different algorithms are used for the implementation of the necessities. Various challenges with linking the algorithms which are developed to an embedded platform have been overcome and the proposed system gets to work.

SYSTEM ARCHITECTURE

The system aims to design a flexible device to help the visually impaired people to make them independent in their mobility. Figure 1 explains the system architecture of the designing of flexible device for the visually impaired people. The input side contains the RGB camera, and GPS. There are two image processing sections integrated with the proposed system. They are Face detection (FD) and Texture detection (TD). Our system comprised of two units, they are wearable unit and indoor unit for assisting the visually impaired people. Figure 2 and Figure 3 shows the block diagram of the wearable unit and indoor control unit for visually impaired people.
RGB camera is employed to capture the VGA image for face identification and texture detection. The captured image is then passed into the processor by blocks. Depending on their output, further actions can be occurred. For example if face detection (FD) detects the face then corresponding algorithm is ready to read the face from camera. Raspberry pi is used as a central processor to control the camera, GPS, and switch. The main processor is employed for coordinating the each module according to their needs. A cloud based server is employed for storing the information about the landmarks and other related information’s. The localization module uses the GPS to find the location of the visually impaired people.

Wearable unit comprised of Raspberry pi, GPS module, Switches and ZIGBEE. Wireless sensor network (WSN) is used for controlling the indoor unit. Here we are using ZIGBEE for wireless communication.

![Figure 1: System Architecture of designing a flexible device to assist visually challenged people](image1)

Indoor unit contains the PIC16f877a as a controller along with ZIGBEE transceiver. Whenever the visually impaired people come in to the indoor area, controller will trigger the relay unit to turn on the indoor connected load.

![Figure 2: Wearable unit of the flexible device to assist visually challenged people](image2)

![Figure 3: Indoor unit of the flexible device to assist visually challenged people](image3)

**IMAGE PROCESSING MODULES**

In this section, the image processing algorithms for texture detection, and face detection and recognition, text detection are explained. The implementations of these image processing techniques are based on the open CV.

**Texture detection:** Different types of texture are chose for the detection of surface texture like grass, road and mud. By using the support vector machine (SVM) classifier the textures are classified. Figure 4
shows the block diagram of texture detection module. SVM classifier is employed due to the portability and effectiveness with the embedded system.

![Block diagram of texture detection module](image)

**Figure 4: Block diagram of texture detection module**

**Feature extraction:** Databases of various classes of textures are created by employing the texture feature extraction. By using camera VGA images (640 x 480) has been captured with the different scale, directions, and related conditions. Each texture class has been captured with more than 200 samples. Samples which are used for training are cropped from the original image of size 640 x 480 to the various different sizes. SVM classifier is employed for its accuracy and it is faster compared with other classifier.

**Classification:** The features extracted from the previous step are employed for training the support vector machine (SVM) classifier. 3000 samples are used for training the every classifier. The approach used during the test time is sliding window. Test has been done by using both types of sliding window. They are overlapping and non-overlapping sliding window approach. For reducing the search space, region of interest (ROI) is used for choosing the required texture area.

**Region of interest extraction:** In various images region of interest can be analyzed by analyzing the number of rows having the required information. As a result the region of interest for each image is limited to 480 x 240. Hence computational time of the process will get reduced.

**Face detection and recognition:** The main aim of the including the face recognition in a flexible device is to help the visually impaired people to recognize known persons in their path.

![Block diagram for face detection and face recognition](image)

**Figure 5: Block diagram for face detection and face recognition**

Face detection is employed for the visually impaired people to give information about the people in the surrounding area. The block diagram for the face detection and face recognition for visually challenged people are shown in Figure 5. The information about the face detection and face recognition are explained as follows.

**Face Detection:** Face detection is based on conventional algorithm along with openCV Haar cascade classifier. It consists of 1047 features and 20 stages. Based on the application needs, openCV needs a multiple parameters for specification. The capability of detecting the smaller face sizes helps in detecting the larger distance. The minimum size of the cascade classifier is 20 x 20 pixels.

**Face Recognition:** After detecting the face from the face detection stage, face recognition tries to match the acquired image from the camera with the images in the database of faces. Most important thing in the face recognition is creating the training database. Several pictures of the subject to be recognized were taken in both indoor and outdoor side. Faces were cut from the images of subjects. With nose as a center face image is registered remaining areas removed from the faces.

**RESULTS AND DISCUSSION**

1. **Texture detection:** Following factors decides the time which is taken for the classification

   - With increased number in the windows per frame, the time taken for the classification is reduced
   - With increased window size in the feature extraction, the time taken for the classification is high

   The above furnished factors affect the time in opposite ways. The best accuracy and the time taken achieved with the size of 80 x 80.

2. **Face detection and face identification:** Higher the scale factor search space will get reduced. Figure shows the difference of accuracy with increase in scale factor.

![Difference of accuracy in face detection](image)

**Figure 6: Difference of accuracy in face detection with increase in scale factor.**
The times taken for the face detection with scale factor variations are shown in Figure 7.

![Graph](image)

**Figure 7: variations in Time taken for the face detection with scale factor.**

Indoor control for the visually impaired can be achieved by using ZIGBEE. When the wearable unit enters into the range of indoor unit the lamp in the indoor unit will turn on automatically thus ensuring the safety of the visually impaired people.

**CONCLUSION**

In this article, a design for the flexible assistive device is developed to assist the visually impaired people with known person identification, reading texts, detecting the texture and for automatic control over the indoor electrical device. This article employs the embedded image processing concepts. This proposed idea will be a initial concept of the demo with the face detection and identification, detection of the text for reading, and detection of texture tasks has been implemented by using raspberry pi along with the required hardware. The location of the visually impaired people will be known by using the GPS. Efficiency and accuracy of the device is increased with the use of raspberry pi.

In future work, we are planning to implement the prototype along with the animal detection, object detection and also the signboard detection. To improve the accuracy the frame rate should be increased.

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**REFERENCES**


Designing a Framework for Vehicle Security by Utilizing Face Identification Method

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ABSTRACT

Due to the evolution in the automobile technology there is rapid development in number of vehicles. This will increase the theft attempts of the car which maybe in the vicinity area or global area. With the creation of well-built robbery method, proprietors of vehicles are in panic for the theft of their vehicles. Hence the safety of the vehicle becomes the primary concern to work on. Advanced vision based real time vehicle security system gives a solution for this problem. The proposed system for the vehicle security carried out by using the real time image processing based legal user verification using face detection and recognition techniques for driving the vehicle. The system employs the Raspberry pi as a central processor which acts as a control system and it is placed on the vehicle. If the person make their entry over the vehicle, system turn on the secret camera fixed in suitable position inside the vehicle and it will check whether the person is authorized or unauthorized. If the person is authorized then the system will turn on the ignition or else it will take image and send it to the concerned proprietor through mail.

Keywords: Raspberry pi 3, Camera, Face detection and face recognition, IoT

INTRODUCTION

Make use of vehicle turn out to be important all over the world and also theft prevention of such kind of vehicle is mandatory [2]. Manufacturers of vehicle are making the preventive measures by developing the advanced security system based on modern technologies for theft avoidance. These security features are usually provided by biometric and non-biometric methods. This kind of systems can fails in sometimes by hacking the password, but it is almost not possible to make duplication of individual characteristics [1]. Biometric systems are latest technology which uses the techniques like recognition of fingerprint, iris recognition and face detection and recognition. On the above technologies, face detection and recognition systems are sophisticated [5]. This method can deploy very easily and people involving theft can be recognized without their knowledge.

In security system of vehicle, the primary objective is to make sure of the vehicle protection. Face identification method is one of the best methods for ensuring authorization. Authorized person only will be providing with access to start the ignition system. The raspberry pi 3 based control system employed as a part of the vehicle for its efficiency. The proposed system uses GPS receiver, and camera. Several algorithms are employed for the detection of the face of the person [3, 4]. The acquired images by camera are evaluated with the database images. Vehicle only starts to move, when the images are matched. If the acquired images are not matched, the system sends the captured image to the concerned person through mail along with the location of the theft vehicle.

SYSTEM ARCHITECTURE

Figure 1: System architecture Designing a framework for Vehicle security by utilizing Face identification Method
In current years, computer visions are playing a key role in identification of users by using biometric system. Biometric system is one of the secured methods in our modern days. Figure 1 shows the system architecture for a vehicle security using face identification method. The proposed system aims to develop the vehicle security system based on face detection and identification.

**Hardware implementation:** Figure 2 shows the block diagram of the vehicle security utilizing the face identification. Hardware setup of our proposed system comprises of Raspberry pi 3 model B as a central controller which is interfaced with a camera, GPS, and key system of the vehicle.

The real time vehicle security system with Raspberry pi comprises image processing unit and control unit to safe guard the parked vehicle from theft. Whenever the person ready to start the vehicle using the key, the hidden camera start to take images. Face detection and identification system identifies and verify that person automatically from evaluating the unique face from the captured image or video.

**Face detection and identification:** The Raspberry pi comprises the unit of image processing within it to carry out function like detecting the face and identify the person, who is authorized or not authorized. This process can be done with two sections. One section is detection of face and another one is face Identification.

**Detection of Face:** The image acquired from the camera is then processed to identify the face by using the cascade object detection. The cascade detector identifies the face of the image acquired and the extraction is carried out in face region. The security systems have the database which is used to store the face images of the approved persons under various backgrounds. The images of faces are improved by regularize them to get rid of the unnecessary information while capturing the image and database is created and these images are saved.

**Identification of faces:** Face Identification can be carried out by using different algorithms. Mostly the algorithm which is based on the feature are employed in the real time safety systems. The various method to extract the features for extraction are Linear Discriminant Analysis (LDA) and Principal Component Analysis (PCA) algorithms. Both algorithms are compared, Linear Discriminant Analysis (LDA) have more efficiency than other method in training a huge sets for identification. By using the database containing normalized images of face, the LDA algorithm is employed for the identification in security system of the vehicle. The feature extractions of the images which are saved in the databases are carried out by Linear Discriminant Analysis (LDA).

The image to be tested is evaluated with the images from the database and the classifiers employed in our algorithm decide the image as recognized or unidentified by using the distance. The images which are in the database are known as the training images and the image obtained by camera is known as the test image. When the distance is lesser than the value of threshold, then the person is classified as authorized and vice versa. Figure 3 shows the image processing based face detection and identification.
If the person is an authorized, then the ignition of the vehicle is turned on or else the image of the person along with the vehicle co-ordinates will send to the concerned persons through mail.

RESULTS AND DISCUSSION

Vision based vehicle security system can be realized by using the raspberry pi as a control unit. The face can be obtained by using cascade detector. The test image is the extracted image from the face detection. The face recognition can be achieved by using Linear Discriminant Analysis (LDA). Figure 4 shows the image of an unauthorized person through mail alert.

**Figure 4: Unauthorized person image by Mail alert**

If the person is unauthorized mail will send to the concerned properitor with the image of unauthorized person. With the help of GPS module the current location of the vehicle also sent through mail Figure 5 shows the location of the vehicle

**Figure 5: Location of the theft vehicle**

CONCLUSION

In this article, a security system for vehicle employing the face recognition is presented. This proposed method can be very efficient and smart method in all kind of environment for protection of vehicle from theft. This method offers the different level of security in vehicle which is more important in our modern world which is surrounded with improved methods of theft. The result acquired by the face identification proves that the system can make sure the safety of vehicle. The proposed system is also reliable. It can be used in various authorization applications relating, banking security, robotics etc.

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REFERENCES


Efficient Topology Control for Improving Energy Efficiency in WSNs

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ABSTRACT
With the increasing attention in wireless sensor networks (WSNs), reducing end to end delay and increasing network lifespan are vital disputes. Topology management protocols participate a significant task in WSNs. The topology control algorithm is used to preserve sensor energy and simultaneously preserve the graph connectivity. The Disjoint Path vector algorithm is utilized to diminish both the network delay and transmission energy of sensor nodes. In addition, handling wake up and sleep scheduling to reduce the unwanted sensor energy consumption, thus prolonging network lifetime. The simulation result indicates that improves the quality of Service and reduces the energy consumption in WSN.

Keywords: Topology Control, Energy Efficiency, Disjoint Path Vector Algorithm, Wake up / Sleep Scheduling.

INTRODUCTION
Wireless sensor networks (WSNs) include multiple static sensor nodes that gather sensing information from different deployed sensors wirelessly. WSN have been used in assorted fields for example military surveillance, health care, spatial exploration, environment monitoring, industrial monitoring, and etc to detect events.

Constraint of an every sensor is the restricted power supply in the form of short battery duration. Battery energy preservation is vital in a sensor device. Life of the battery is crucial components in prolonging the sensor nodes life time and its network [1]. So optimization of sensor energy method should be performing when manipulative a network. The numerous mechanisms are mainly concentrating on electing smallest otherwise energy efficient path. Frequently alter the head depend on size of packet to extend the life of the network, remaining energy. Accordingly network delay and sink packet loss rate improves and maximizes lifetime of the network and energy efficiency.

Minimizing energy utilization is an important objective in many multi-hop WSNs, particularly the nodes are operated by battery energy. WSN vary from another cases of wireless networks because of the sensor sensing information is delivered to a single base station (BS). Obviously, the primary pertains is the network lifespan.

Topology management is utilized for maintaining network connectivity as well as minimizing energy exploitation. The disjoint path vector to minimizing the disjoint vertex and create the network topology. The Wake up and sleep scheduling also improve the energy efficiency in WSN.

RELATED WORK
WSN is used to watch variations in the area of a given field. Connectivity, communication, and Coverage of the network are the primary difficulties in WSN. Sensor nodes are predominantly battery functioned and work for a prolonged time devoid of replace the batteries. The evaluation of the network efficiency habitually defined regarding how efficient in finding the given physical environment [3]. Coverage of energy efficient of the sensor nodes in WSN is necessary and has plenty of scopes in the research area. Connectivity can describe the capability of the sensor to achieve the data sink. Discovery a best node exploitation plan that offers wide exposure with network connectivity is fairly hard.

Fault tolerant topology Scheme is used to construct the WSN efficiently [2]. This scheme main operations are identifying the node faulty and how to retrieve the network from fault not including any alteration. Connected Dominating Set mechanism is used to boost
the efficiency base on the mesh topology. By novel algorithm, enhance the efficiency to recuperate from the faults while higher node quantity.

In [4] Topology Control Algorithm consists of three phases: 1. finding the connecting nodes at highest conduction, 2. pairing nodes with unwavering algorithm level of the energy, and 3. determining least power transmission per-node for conserving the energy. The algorithm works-out nearby and dispenses full graph connectivity, and tentatively would be capable to decrease WSN control overhead.

WSNs have gain rising concentration from research community and users. WSNs are mainly utilized to endlessly gather the information from surroundings [5]. To organize their function, it is essential to keep a robustly associated network topology. Though, a node failure may cause partition network into displace obstruct and as a result, infringe a node connectivity aim.

In [6] explained tree topology that focused on increasing pretentious restricted battery energy and lifespan. By correctly choosing the trees so which has a dissimilar assembly of pre exhaustion nodes got a scheduling algorithm. The main advantage of this topology has smaller delay during data transition.

Localized topology control is pretty to generate decreased network topology on attractive features for instance decreased power transmitting as well as sparser connectivity [7]. This scheme which is energy efficient called X-LMST for attain the lifetime of the network to be extend. Every node separately builds a minimal spanning tree (MST) with local energy efficiency for discovering a decreased neighbor set while avoiding over usage of energy-critical.

In a great and difficult disseminated sensor network, the separate sensors are communicates with its neighboring sensors only. Topology control is a method for establishing best possible transition parameter to every sensor; hence better performance of the network [8]. In this scheme proposed active topology control plan for enhancing the lifespan of the network.

In the energy controlled environment of WSNs, efficiency of the energy is of prime anxiety. In this paper, proposed a PEGASIS is a centralized routing protocol which is energy efficient. A distributed PEGASIS (DPEGASIS) that not only form the nodes in a chain like manner but is also fitting for huge networks [9]. DPEGASIS can also be used with PEGASIS based protocols that split the network in several slices or sectors and then form a PEGASIS chain in every sector. If these slices vary vigorously during network operation then DPEGASIS can be utilized to repeatedly rebuild the chain in each slice.

Efficient Topology Control for Improving Energy Efficiency in WSNs

In this paper, Efficient Topology Control (ETC-IEE) for Improving Energy Efficiency in Wireless Sensor Networks is proposed. In this scheme, sensor nodes are immovable, restricted energy and homogeneous features and sensor node functions are sensing, transmitting and receiving in the network. The WSN is operated by (BS). It has unlimited energy also it is handled all sensor nodes. To minimize energy utilization, the representative idleness of sensor nodes in a WSN can be demoralized by laying nodes to sleep what time they does not require to be active.

This scheme contains two level works one is topology management and another one is data transmission in WSN. Initially, the sensor nodes formed the cluster and the sensing information gathered by the sensor leader (SL). This SL function is collecting the data and send to the BS via another SL. SL removes the redundant data then forward to the BS.

ELSTC scheme uses the algorithm known as Disjoint Pathway Vector for minimizing the disjoint vertex from path and creates the network topology for collecting data by sensor nodes. The main intend of this scheme is to diminish sensor energy during data transmission.
Figure-1 explains Structure of ETC-IEE Scheme. The SL broadcast the init message to gathers the route information. This message consists of node location and node ID. The SL accepts this Init message and it changes route table. This route table contains ID of SL and the cost of the connection among SL and destination node. The cost of the connection is measured based on the DPV algorithm. The disjoint route is determined as a set of routes with mutual end points which have no other vertices in mutual. This network topology is an undirected weighted graph G(V,E). Where V denotes the nodes and E denotes the Edges.

![Figure 2: Disjoint Pathway Vector Algorithm](image)

From Figure 2 the route from source S to destination D contains 3 paths. The path 1 DPV is 2, path 2 DPV is 1 and route 3 DPV is 3. Every SL builds the Path Information Message (PIM) and it communicates the PIM to the near SL. This PIM consist of node ID, route information table, Time to Live and energy. The SL accepts this PIM and assures the grouping of previous and present obtained path information via PIM. The DPV is computed to present and previous path. If the present path diminishes the DPV, then the route information table is modified. Or else, this path information table is not modified. Each SL obtains the PIM during path information gathering period.

Next every SL transmits the notify message for each of its preferred disjoint route. If suppose two neighborhood nodes does not mark each other as necessary neighbor that connection is not need and it is unconcerned. During data communication, the SL elects the highest energy and the lowest DPV path. This algorithm can attain less transmission power and improve the QoS in the network.

The wake up / sleep scheduling constructs the sensor nodes are lively or inactive state. The wake up/sleep time is changed periodically also sensor node condition depends on the sensor energy level. Originally each node has sleep state. During sensing and data transmission sensor nodes are going to active state. Therefore, better energy can be saved during data transmission in the network.

**SIMULATION AND DISCUSSIONS**

The performance of the QoS-EDTC method is examined by the Network simulator. The simulation of the projected method has 50 nodes disposal in the simulation region 800×800. The nodes are communicated with others by the help of communication protocol User Datagram Protocol.

**End to End Delay (E2ED):** The difference of time among the current packets received and the previous packet received is called End to End Delay (E2ED). It is calculated by the equation 1.

$$\text{AveE2EDelay} = \frac{\text{Pkt Recvd Time} - \text{Pkt Sent Time}}{\text{time}} \ldots (1)$$

![Figure 3: E2ED of PEGASIS and ETC-IEE](image)

Figure 3 indicates that the range of delay is small for the projected method ETC-IEE than the presented method PEGASIS. The throughput value is larger means that of delay value is smaller in the network. The delay in the network may lead to lose the information. The information must not get lost because of the delay factor, therefore proper sharing is required in this phenomenon during data transmission.

**Throughput:** The average of victorious messages sends to the base station. The throughput is calculated using equation 2.

$$\text{Throughput} = \frac{\sum_n \text{Pkt Size} \times \text{Pkts Received (n)}}{1000} \ldots (2)$$
Figure 4: Throughput

Figure 4 indicates that the projected method PEGASIS has better throughput when compared to the presented method ETC-IEE. Throughput is the important parameter in determining the presentation of the network. If there is improved throughput, system can perform in an efficient manner.

Residual Energy: The quantity of remaining energy in a node at the present case of time is called as residual energy. In the network operations the rate of consumed energy is calculated by the residual energy.

Figure 5: Residual Energy

Figure 5 indicates that in the network the residual energy is enhanced for the projected method ETC-IEE when compared with the presented method PEGASIS. In ETC-IEE, reduce the node will be dead also As long as there is residual energy, the network would have an enhanced network lifetime in the network.

CONCLUSION

WSN consists of communication capabilities and restricted source of power, in some way expected to function at comparatively prolong time in cruel environment. Here, Efficient Topology Control for Improving Energy Efficiency in WSN is proposed. The Disjoint Path vector algorithm is utilized to diminish both the network delay and transmission energy of sensor nodes. The goal of the Disjoint Path vector algorithm is to minimize the total transmission power of the nodes in the network. Also, handling wake up and sleep scheduling to reduce the unwanted sensor energy consumption, thus prolonging network lifetime. The simulation result proves that improves the QoS and reduces the energy consumption in WSN.

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FPGA Based Prominent Fir Filter Using Xilinx System Generator

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ABSTRACT

FPGA based prominent FIR filter using LMS algorithm invented by the use of simulink in Xilinx System Generator. Execution process of Prominent FIR filter in FPGA using LMS algorithm has been evaluated and presented. FIR filters coefficient and system determined by FPGA using Xilinx System generator. The proposed FPGA based prominent FIR filter using Xilinx System Generator used to reduce the area, power and delay of a system. Proposed architecture has been simulated by simulink simulation environment and performance analyzed by Xilinx 12.4.

Keyword: Finite Impulse Response (FIR) filter, Least Mean Square (LMS) algorithm, Xilinx System Generator, Field Programmable Gate Array (FPGA).

INTRODUCTION

In DSP applications, FIR filter have more properties. FIR filter mostly designed by the use of Impulse Response Truncation however it has unwanted frequency domain description due to this Gibb’s phenomenon has been used. FIR filters of large order to meet the severe frequency specifications have been used which increase the speed of digital communication. Hence, the term FIR is practically identical with “no feedback”. For this rationale FIR filters are simple than IIR filters. In adaptive filtering LMS algorithm is mostly used for some reasons. Low computational complexity has been achieved by the use of LMS algorithm and stable behaviour. The convergence study of the LMS consumes the independence statement.

RELATED WORKS

Das et al., [1] projected Equiripple process which invents a FPGA based higher order FIR filter with the help of FDA Tool and Xilinx System Generator. Equiripple method with low-pass higher order FIR filter has been proposed. Sampling frequency of 100 KHz is designed by low pass filter and pass band & stop band frequency of 10 KHz & 20 KHz.

Vidal et al., [2] presented vibrational analysis to analyze some machine in the production; however this scheme provides costly signal conditioning/processing plans and important capability for the examination of signals in the frequency domain. Digital FIR filters are used to complete a novel scheme of failure detection in machine. The test machine has been composed by the methods of data acquisition which provides accelerometer and data acquisition card. Optimal and failure conditions are used to estimate the data from machine. Xilinx System Generator has been used to calculate the FIR filters method. Gears and bearings calculated by the structure design of four filters.

Safarian et al., [3] explained FPGA execution of an LMS adaptive filter which takes 1 set of multipliers for both filter output and weigh-increment term calculation. 12-tap adaptive filter in Xilinx system generator and executed the filter using the Vivado tool set. The conventional method utilizes 4.7 times more than proposed design. Proficient FPGA recognition of an LMS FIR adaptive filter for real-time DSP applications of projected design is opted.

Mohanty and Meher [4] developed a new LUT sharing process for the calculation of filter outputs and weight increment blocks. Parallel design for the execution of BLMS ADF derived by the projected DA formulation and it takes 25% more flip flops. The projected method has 2.47 times additional adders, 15% additional flip-flops, 43% fewer LAPO than conventional design. In projected method, filter length 64, has approximately 14% and 30% reduced ADP and 25% and 37% reduced EPO than conventional method.

Dasharatha et al., [5] proposed LMS adaptive filter which performs the signal and intended for producing
filter coefficients depend on the processed signal. This method decreases the power expenditure and area due to variation of the weights. The projected method simulated in Modelsim and synthesized by Xilinx ISE. 46% area and 23% power has been enhanced compared to usual FIR filter.

Novak and Gieske \[6\] explained nonlinear regular differential equation as a MATLAB Simulink reproduction and we use harmonic and random-noise inputs to examine gain modulation. The pump-to-signal and signal-to-signal transfer functions are computed by standard signal processing methods. MATLAB simulink model has been implemented by the set of EDFA parameters.

Aggarwal A et.al.\[7\][8] describes the parallel processing capability of the FPGA greatly increases the speed of operation with the implementation of using the Digital Filter, also implemented in simulink. An architecture with 100% efficient and has a throughput rate of one filter output per 2B cycles. In addition, it possesses simple, regular communication and control structures and is thus well-suited to VLSI implementation\[9][10].

**FIR Filter:** In DSP, FIR filter provides the result of it settles to zero in finite time and the impulse response of an Nth order discrete time FIR filter takes N+1 sample prior to it that settles to zero. Figure 1 represents structure of FIR filters for n orders. Filters activated on discrete time signals and FIR occurs since the filter output is calculated as a weighted, finite term sum, of past, present and perhaps future values of the filter input.

\[
H(z) = \sum_{u=0}^{N-1} h(u)Z^{-u} \quad \text{...(1)}
\]

Where, N-length of filter
\(h[u]\)-impulse response

\[
Y(u) = \sum_{k=0}^{N-1} h(k)x(u-k) \quad \text{...(2)}
\]

Where, Y (u) – Output Signal
\(x(u)\) – Input Signal
\(h (k)\) – impulse Response

![Figure 1: Structure of FIR filter of order N](image1)

**LMS using Adaptive algorithm:** Time varying signal evaluated by an adaptive FIR filter and it has more adaptive algorithms that is recursive least square and kalman filters, however mainly LMS algorithm has been used. This LMS algorithm is easy and powerful which implemented to take benefits of lattice FPGA designs. Highly correlated input signal are degenerates the performance of the LMS algorithm(in Figure 2). Performance is poor which is depend on the higher Eigen values spread of the auto-correlation matrix R. This problem defeat by the transform domain LMS algorithms which enhances the performance.

\[
e(u) = d(u) + y(u) \quad \text{...(3)}
\]

where, e(u)- error signal
d (u)- desired signal
\(y(u)\)- output signal

![Figure 2: LMS using Adaptive algorithm](image2)

**RESULT AND DISCUSSION**

Verilog HDL is used to complete the projected FPGA based prominent fir filter using Xilinx system generator. ModelSim 6.3c has been used to estimate the simulation results and Xilinx ISE 10.1i used to evaluate Synthesis Performances. Figure 3 illustrates that the simulation results of projected FPGA based prominent fir filter using Xilinx system generator. Figure 4 and Figure 5 shows the input and output spectrum of an FIR filter.
CONCLUSION

In this paper, an performance of FPGA based prominent fir filter using Xilinx system generator has been proposed. The simulation result of FIR filter shows the better performance than conventional method. The FIR filter using LMS algorithm was Simulinked and synthesized on FPGA which increase the speed of operation which also reduces the delay and area of a system design.

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REFERENCE


Investigation of Various Input Based on DC-DC Converter in a Hybrid Vehicle Application

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ABSTRACT

This paper proposes the study of various DC source input based converter for the use of hybrid vehicles. The various DC input includes the solar energy, fuel cell and battery. In spite of solar and battery source, the fuel cell is used as primary source. The solar energy is utilized by the solar panel and it is fed to the battery for the storage purpose. Thus the battery acts as back up source for the vehicle. The converter serves as the boosting circuit while the source efficiency is lesser due to lack of sources. In addition to that the MPPT algorithm is utilized for optimal use of solar energy. The controller design for the converter is also proposed. This prototype is implemented using Matlab/Simulink.

Keywords: DC-DC Converter, Fuel cell, Solar panel, Battery, Hybrid Electric Vehicle.

INTRODUCTION

The hybrid power system has the trends in recent power system. Hybrid power system comprises of different energy sources such as renewable energy [1-2] sources, Fuel cell, and battery. The multiport converter [3-5] is suitable for grid applications. The multiport converter has some issues that could control by using control topology. Converter structure can classify into two types; there are isolated and Non-isolated, where the isolated [6-8] converters are suitable for grid system and electric vehicle application. These also have some disadvantage like large in size, high cost and induces high losses. But in Non-isolated has small in size, low cost. Due to the above reason non-isolated converter proposed. It is suitable for electric vehicle applications. DC-DC boost converter cannot work correctly due to the battery can discharge by photovoltaic and charge by the Fuel cell. The maintaining of power in the battery is done by charging and discharging simultaneously. It reduces the bidirectional converter port because the bidirectional converter requires an energy storage system. So it cannot be used in this proposed system. Then the initial cost of the panel is high due to power extracted from the panel to compensate that we are using MPPT [9-10] algorithm. Here power flow management is also introduced to reduces the losses occur in the system. The DC voltage is increased using the proposed boost converter [11-12]. Therefore the three input converter combines the Battery, Fuel Cell & Photovoltaic panel and it connects to the motor for vehicle applications.

PROPOSED TOPOLOGY

Figure1 shows the overall block diagram of the proposed system. The proposed system includes three input sources are photovoltaic array panel, fuel cell, battery, multiport converter with Simple Boost Pulse Width Modulation Technique and then a three-phase inverter with a motor load. The DC sources get from PV, Fuel cell, and Battery is feed to the DC bus multiport converter which converts the DC-DC voltage and boosts the voltage. It will send to three-phase inverter after that motor for vehicle applications. There are three states of operation; Zero state, Discharging state and Charging state.

During charging state, the switch S3 is OFF, and D1 will conduct. It also has four modes of operations. In this operation, mode battery isn’t useful. Then the equation will be written as

\[ I_{\text{Battery}} = 0 \]
\[ P_{\text{Battery}} = 0 \]  

During discharging state of operation, it has four modes of operation. The voltage and power equation of battery written in equation (2)
\[ I_{\text{battery}} = d (I_L + I_D) \]
\[ P_{\text{battery}} = V_{\text{battery}} [d (I_L + I_D)] \]  
\(...(2)\)

\[ I = I_L - I_D \]  
\(...(1)\)

**Modeling**

**Photovoltaic Panel (PV):** The solar power is obtained by the conversion process of solar light energy to the useful electrical energy. The conversion process is performed by photoelectric effect. Photovoltaic cells are operated at their maximum power point. The photovoltaic panel consists of cells which are connected to form a single unit. In the power generation, it can widely increase because of its advantages. Figure 2 shows the circuit diagram of a single diode model. The output current of the PV panel is obtained as

**Battery:** The battery is another source to the converter. The battery performs the operation of charging and discharging the given supply. The demand of the load decides the rating of the battery. If the demand varies, then the rating of the battery will also change. The circuit diagram of the battery connected to the load shown in Figure 3.

**Fuel Cell:** Fuel Cell acts as main source for the proposed paper. It is one of the most popular sources used in the power generation area. Due to it has less maintenance, production of less noise, less weight and low cost widely used in recent days. In here, it is used for charge the battery. In this proposed system hydrogen fuel cell is to produce the power. Figure 4 shows the circuit diagram of the hydrogen-based fuel cell with the load.

**Multiport Converter:** In proposed multiport DC-DC boost converter has three DC port in single circuit and it operated at under its rated power. The DC-DC converter invokes the process of boosting the input voltage before fed to the three-phase inverter. Input is about 12V then it will boost into 135V. The multiport boost dc-dc converter is shown in Figure 5.
Three Phase Inverter: The three-phase inverter has eight possible configurations of six switches. In each leg, upper and lower switches are complementary to other switches. The triggering of switches is performed by the Simple Boost Pulse Width Modulation Technique (SBPWM). Figure 6 shows the circuit diagram of three phase inverter.

Permanent Magnet Synchronous Motor: The electrical energy which is obtained is transferred to mechanical energy by the employ of motor. Here high-speed PMSM motor for hybrid electric vehicle application is presented. Recently, induction motor and DC motor frequently used in various applications. Since the permanent magnet synchronous motor has compact, lightweight. Internal structure of the permanent magnet synchronous motor is shown in Figure 7.
RESULT ANALYSIS

The various input based on DC-DC converter in Hybrid vehicle application is implemented using Matlab/Simulink. And the overall simulation diagram of a multiport DC-DC converter with motor is shown in Figure 8. The output voltage of the DC link is plotted between times (sec) versus voltage (V) shown in Figure 9. Figure 10 shows the output waveform of Speed (rpm) versus time (sec).
CONCLUSION

The different input & converter based hybrid electrical vehicle and the desired control technique are implemented. The investigation is done based on the converter performance. And the proposed converter is most suitable for renewable energy resources and hybrid electric vehicle application. An essential role of the converter is to provide high reliability, high efficiency for utilizing maximizing the industrial application using proper controller technique and MPPT algorithm is achieved for maintaining the power, it will enhance the efficiency of the system. The enhanced voltage gain is used in the hybrid electric vehicle application. Simulation results are implementing and validating using Matlab/Simulink software tools.

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Security and Privacy Protection Method for Women Safety Based on IOT

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ABSTRACT
Women safety is been a major factor in our nation. As years been passing but there is no improvement in the safety for women. New technology has been involved here to give protection for women but there is a drawback in some factor. To overcome this problem we are coming with new technology which is IoT based Women safety and security by using raspberry pi module. Here, we are utilizing the pi board and it has a various sensors associated with that. Someone is going to attack or theft from the women, and then women gave simply a switch button so that camera will capture the image and sent it to the nearest police station along with GPS location with the help of Cloud service. If police is late to arrive there then women will have a Defibrillation. This defibrillation can be used as a weapon for woman to attack the person till police arrive at the place.

Keywords: Defibrillator, IoT, GPS, Camera, Cloud service

INTRODUCTION
The technology is been changing year by year but there is a draw in the women safety [2]. From the past years, women’s are using their own defensive mode to be secure but we are not successful enough to avoid those violence. Lot of techniques can be involved like face reorganization, safety sensors, live monitoring and GPS tracking [1]. All this techniques are good in field of some parts but has drawbacks.

Women enduring infringement are even prevented from claiming the essential human rights. gender based savagery has turned into a national and also global plan due to decades long battles by common society joined by women’s developments[1,3]. In spite of the fact that there are phenomenal quantities of laws against abusive behaviour at home, rape and different types of savagery in every last nation to ensure their female citizens to wind up a casualty of any such brutality however they are confronting real difficult in actualizing such laws. Subsequently making the general public vile and shaky for the women’s as in lion’s share of cases the violator stays unpunished [4]. We as a whole should centre on guaranteeing a society which is secure for every one of the women’s around the world with the goal that they can encounter correspondence and equity. The guard strategy utilized by females should be reformed by embracing current innovation and devices to shield them from their oppressor.

Now this is the time to utilize our technologies and to make women safety with the help of IoT based device [7]. The device is been in form of jacket and is fully electronic. The person who wearing this jacket only has to operate the electronic circuit and need to protect herself from the danger. The circuitry is been build inside the jacket .To prevent from the electronic circuits it is been coated with well insulation layer of the jacket. The outer portion of the jacket is been well insulated from the circuits. Women will have a secret button in the jacket which is been interfaced with the cloud service. If someone going to attack then they can protect herself by pressing the secret button .once button is pressed the camera will be activated and it starts capture the images and passes to the server room. By utilizing this process we can improve our safety and protection towards women. This gadget is the good solutions to the women are who deserved to be safe and secure.

PROPOSED SYSTEM MODEL
In this proposed work, we will actualize this task as a women security device. On the off chance that women is managing undesirable unsettling influence or by a robbery around then they should press the switch. In the
event that they presses switch, the camera will catch the image of the occurrence. After that the captured image will go to the police station through a server. In the meantime the wearable defibrillator will get initiated and the shock will be created to the undesirable individual. At that point the GPS is initiated and get the area of the occurrence and forwarded to the police office through server. GPS is utilized to get the area through satellite and it sends the data to the individual gadget through UART Protocol. Figure 1 shows the design of the proposed system.

![Figure 1: Proposed System Design](image)

The controller which is acting is a raspberry pi which is a mini computer helps to write program in our specified code. Camera is been connected with USB, with the help of IP address we can communicate with the cloud service. If a women presses the switch then information is been passed to pi board and it communicates with memory elements and camera start capturing the images and it passes to the nearest police station. If police fails to reach the spot in given time then person uses defibrillator and can protect them. GPS is been installed in the device which helps to track the location.

**MECHANICAL SPECIFICATION**

**Raspberry Pi3:** Raspberry Pi3 which is nothing but a mini computer. It is powered with a BCM2837, which is Broadcom system on chip processor integrates with several signals like analog, digital and sometimes mixed signals. Figure 2 gives the layout of the Pi3 board which is in size of small visiting card.

![Figure 2: Layout of Raspberry Pi3 Board](image)

**Defibrillator:** Defibrillator is medical equipment, used to generate vibrations in the human body. We are going to utilize this equipment to protect women from the strangers. Wired defibrillator is shown in Figure 4. If some are going to attack us then we can utilize this as a weapon and can be used for the attacking purpose.
**Camera:** Camera we are going to use for the purpose of capture the images frequently when switch is been pressed. We are going to use “IPWEBCAM” to get the IP address of the camera and with the help of IP address we can access the camera through Pi3 board. Figure 5 shows the camera to be interfaced with the raspberry pi3. Camera cost can be depended on the way we are using pixels or we can use our own mobile phone through wi-fi created in Pi3 board.

![Figure 5: Camera with USB](image)

**Global Positioning System (GPS):** GPS stands for Global Positioning System. GPS is been interfaced with Pi3 board. Once switch is pressed in the pi board, GPS turns ON and started sharing the location to the nearest police station through cloud services. GPS interfaced with the raspberry pi is shown in Figure 6.

![Figure 6: GPS installed in Pi3 board](image)

**RESULTS AND DISCUSSIONS**

Whenever the abnormal activities happen to the women by someone, if switch is pressed the shock is produced by the defibrillator is applied to that person. At the same time the camera from our system capture the image of that person and send to the police server through mail. Figure 8 shows the image alert through the mail.

![Figure 7: Emergency alerts with Location through mail](image)

System also sends the exact location of that person through the mail. Figure 7 shows the emergency alert with location through email.

![Figure 8: Image alert through mail to police server](image)
CONCLUSION

In this article, an idea for the security and privacy protection method for women safety is proposed and implemented. This system is efficient and its performance is high because of the use of Raspberry pi 3. The camera will take the images of the person who are misbehaving with the women. Built-in Wi-Fi unit in the raspberry pi easily facilitates the system to send the mail to the concerned authorities. Exact Location of the problem occurred also send to the concerned authorities through mail. So this system can be implemented easily and also ensures the safety and privacy of the women.

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The Digital Audio Watermarking Based on Tetrolet Wavelet Transform

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ABSTRACT

The digital audio watermarking scheme based on Tetrolet wavelet transforms to extract a watermark in image by hiding the audio in image. To determine the sub-image in the host image the essential features lies in it. In the most significant region of the host image, the invisible insertion of the audio in the image after watermarking, the tampering of that image is destroyed and degrades the original quality of the image. Tetrolet transform is used to build the efficient watermarking method and used for the extraction it connects the four identical squares called as tetrominoes and each of them it is attached over the least one square in the boundary of the image. In this method, the Tetrolet transform used as a transmitter to extract the image.

Keywords: Tetrolet transform; Audio signal; Digital watermarking; Feature extraction

INTRODUCTION

Imperceptible digital watermarking scheme is discussed in [1] for multiple transform domains. Audio-visual is discussed in [2] quality assessment multimedia: A comprehensive survey. In recent day’s audio signal, video, and audiovisual perception have detailed the requirement of the signal reference, extraction, and feature mapping classification method. The quality perceptual multimedia calculation proved to complicate task, applications and it is devoted to the development efforts and a plentiful of research leading development in the field. Digital audio watermarking is discussed in [3] for the cepstrum domain. The digital sound watermarking method has to determine the frequency of human auditory signal and coefficient of cepstral. The watermarking method has to estimate the audio signal from the embedded signal by the pseudo-random sequence method. A new digital adaptive watermarking is discussed in [4] based on support vector regression. The adaptive watermarking has advanced way compared to the encryption method. The support vector regression method has used for enhancing the efficiency to detect the signal.

Audio watermarking is discussed in [5] for copyright protection of digital audio data. This sound watermark method has to attain correlation detection to extract the information without requiring the perceptual transparency after the embedding and whitening method. An adaptive audio watermarking is discussed in [6] the wavelet domain is based on the singular value decomposition. A novel audio watermarking algorithm is presented in [7] for the production of digital audio copy right. The watermark improves the stability of the embedded system and embedded by amplitude and phase of the quantizing signal. Modified patchwork is discussed in [8] algorithm: An audio watermarking scheme.

The audio watermarking has some constraints such as, inaudibility and robustness. The patching algorithm has used for image watermarking and enhanced the effectiveness of watermark. A robust is discussed in [9] statistics characteristics in digital audio watermarking. The synchronization code method and digital audio statistics characteristics method, desynchronization attacks are against the new robust audio watermarking scheme are implemented. The audio articles are performed by the DWT and the audio segment is cut into audio sections, embed the watermark bit into statistical average of low-frequency. Audio watermarking spread spectrum in PN Sequences using multiple orthogonal variable in polarities and variable embedding strengths is introduced to regulate the strength of the PN sequence for indicates the series of watermarking to split from bits to audio signal [10-12].
Wavelets are discussed in [13] for speaker recognition using GMM classifier. The wavelets are widely used in speaker recognition and the other advanced methods. Microarray data classification is discussed in [14] using dual-tree m-band wavelet features. The wavelet transforms used to detect the lung cancer, brain cancer, etc., the dominant features are extracted by this method. In figure 1 (a) shows the original image and (b) shows the audio hiding watermarked image.

![Figure 1: Original image (a) and Audio hiding watermarked image (b).](image)

**MATERIALS AND METHOD**

In this proposed system the digital audio watermarking based on Tetrolet transform to achieve the better performance according to the lossless audio signals.

Tetrolet transform is used to build the efficient watermarking method and used for the extraction it connects the four identical squares called as tetrominoes and each of them it is attached over the least one square along the boundary of the image. To achieve the watermark image the audio signal is converted by the transformer to produce the watermarked image. The digital audio is extracted from the transforms, and it recover by the transmitter to get the retrieved watermarked image. Finally, the digital audio is performed by the use of the Tetrolet transform. Figure 2 shows the workflow of digital audio watermarking.

![Figure 2: Workflow of digital audio watermarking](image)

**RESULTS AND DISCUSSION**

This method is implemented by the audio signal. This experiment has the image and digital audio. Tetrolet transform connects the four identical sides of the square and all are relate by boundary of the image is used in the watermarking purpose. Then the feature extracted by the transforms and then the transmitter is used to recover the watermarked image. The audio watermarking is performed by the transform. The result has the high accuracy of digital audio.

**CONCLUSION**

In this proposed method the digital audio watermarking based on Tetrolet transform is performed. The input image is image hidden with the audio signal. Then Tetrolet transform used to implement the extraction of image. The transmitter used to recover the watermarked image. The audio watermarking perform by the Tetrolet transform. The performance of the proposed system has high accuracy.

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The Glaucoma Image Classification Using Texture Features
For SVM Classifier

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ABSTRACT

The most dangerous cause that occurs blindness is glaucoma; the aging society is mostly affected by this defect. It causes due to the increase of pressure in the optic nerve, and it causes more damage to the optic nerve. The accurate and efficient glaucoma classification can be pursued by the texture features in the images. The texture feature extraction around the optic cup shows the precise results for the identification and classification of glaucoma. From the texture feature extraction, the Support Vector Machine (SVM) classifier used to classify the result. The high level accuracy on different images is done by the classification method. The results show the accuracy of this method.

Keywords: Glaucoma; Texture Feature Extraction; Classification; SVM classifier

INTRODUCTION

Automatic diagnosis of glaucoma is discussed in [1] using fundus images extracted by correntropy features and empirical wavelet transform. Comparing to other channels, the highest accuracy of color image is yield by the green channel. The texture feature of different frequency bands of decomposed components are computed by correntropy features. The automatic diagnosis of glaucoma is based on image processing is discussed in [2] for the wavelet features of the optic disc segmented from fundus image. In a segmented optical drive, the noisy blood vessels removed, and the functions extracted from the de-noised image. The glaucoma detection and classification for image processing technique is based on adaptive threshold discussed in [3]. The cup-to-disc ratio, neuro-retinal rim area in the different regions of the optic nerve in blood vessels used to take consideration for glaucoma detection. Fully automated detection is discussed in [4] for optical coherence tomography images are used in diabetic macular edema and dry age-related macular degeneration. The easy way to implement classification method based on SVM classifiers is segmentation of inner retinal layers. Automated diagnosis is discussed in [5] for digital fundus images are used in age-related macular degeneration using grayscale features. The non-linear features extracted by texture features can identify the lesion, the SVM classifier used by all the dataset namely private, ARIA and STARE. Superpixel classification is discussed in [6] based on segmentation for glaucoma screening in optic disc and optic cup. It is the initialization for other models. Cups dominate the cup segmentation in the trained classifier with medium sizes in the SVM. Evolutionary algorithm is discussed in [7] for automatic diabetic retinopathy grading based on classifier parameter: A hybrid feature extraction approach. The diverse images and better features are improved by classification efficiency. The fast decisions are made during the mass screening of retinal images. Automatic extraction discussed in [8] of retinal features from color retinal images for glaucoma diagnosis. The evaluation of automatic extraction methods based on characteristics that include optic cup to disc ratio, retinal nerve fiber layer, peripapillary atrophy, neuroretinal rim notching, vasculature shift, etc., Wavelet-based energy features discussed in [9] for classification of glaucoma image. The subsets of elements have fed to a set of rating to the effectiveness of these features. The energy obtains the detailed coefficients used to distinguish between healthy and glaucomatous images. Data mining technique is discussed in [10] for the higher order spectra and wavelet energy features in automated diagnosis of glaucoma. SVM classifier can detect glaucoma and regular classes with the highest accuracy. The diverse images are improved by the classification efficiency. Automated segmentation is discussed in [11] for pixel
classification of retinal layers in ophthalmic OCT images. The texture features are segmented manually by training the classifiers. The performance depends on the type of elements that provided. Automated diagnosis is discussed in [12] for higher order spectral features and texture in glaucoma. It can easily incorporate into existing medical infrastructures; it makes a clinically viable option. During the image acquisition, the lighting conditions are controlled using the better classifiers and better features for higher accuracy.

Machine learning approach is discussed in [13] in the detection of retinal images to automatic exudates for diabetic patients. With the less false exposure, the SVM classifier tends to delineate boundaries accurately. The SVM classifier is better regarding the performance evaluation and its superiority evident in the images. Performance testing is discussed in [14] for differentiating obstructive lung diseases based on texture analysis in several classifiers at high-resolution computerized tomography. In overall accuracy, SVM had the best performance, and it had a reasonable fastest time. Automated diagnosis of glaucoma is discussed in [15] using digital fundus images. The accuracy of high degree is computed by the features called cup to disc ratio. The existence of glaucoma indicated by the shift of blood vessels and shift in the optic nerve towards the nasal. Glaucoma image classification is discussed in [16] using discrete orthogonal Stockwell transform. The rating is done by the transform in the image and also for the recognition analysis. Computer-aided diagnosis is discussed in [17] of glaucoma detection using digital fundus image. The glaucoma classification is made by fundus images to detect the images in the databases. Analysis of different wavelets is discussed in [18] for brain image classification using support vector machine. The SVM classifier widely used in the classification of brain images with the higher accuracy classifier. ECG Signal Classification is discussed in [19] Based on Statistical Features with SVM Classification. The SVM classifier is also used in the ECG signal classification whether the signal is a correct signal or not. Figure 1 (a) shows the normal image and (b) shows the abnormal image.

MATERIALS AND METHOD

In this proposed system the classification of glaucoma using the texture features and the SVM classifier is performed. The pre-processing step and then decompose the input images, and then texture features is extracted. Then the SVM classifier is used for the classification of features, to organize the image as a lesion or non-lesion. The function of our method are, Pre-processing, Feature Extraction and Classification. The input images are decomposed by the pre-processing technique and use the decomposed images for the feature extraction. From the decomposed image the features are extracted by the texture features. This texture-based feature extraction used for extract the features. SVM-classifier does the classification process. The classifier gives the result for the proposed system. Figure 2 shows the workflow of glaucoma classification.

Results and discussion

The image datasets implement this method. The experiment was prepared by using a set of the lesion and non-lesion images. These images are used to decompose by the pre-processing technique, Figure 3 shows the decomposed image. Then use texture features for the feature extraction from the decomposed image. Then SVM-classifier is used to classify the elements, and then the result shows the lesion or non-lesion image.

Figure 1: a. Normal image Figure 1: b. Glaucoma image

Figure 2: Workflow of glaucoma classification

Figure 3: Decomposed image
CONCLUSION

In this proposed method glaucoma classification using SVM-Classifier and texture features is implemented by the SVM-classifier. The input images decomposed by using the pre-processing technique. Then the texture based features are extracted by the decomposed images. The classification is made by SVM-classifier for the extracted image. The SVM-classifier gives the higher accuracy for the result. The proposed system performance obtained as the higher accuracy for the overall classification system.

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Trust and Mobility Based Clone Attack Detection in Mobile Wireless Network

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ABSTRACT

Owing to the need of systematization individuality administration, the transmit character of Mobile wireless network, clone attacks are forever attractive. This attacker can make numerous clone identities on their physical devices. To isolates this clone attack Trust and Mobility based Clone Attack Detection in Mobile Wireless Network (TMCD) is proposed. In this projected method, the perceive signal strength is used and energy trust for the discovery devoid of using additional devices and trusted third party. Ahead the discovery of hateful identity, they would be ostracize and sequestration. The received signal strength captures the clone attacks locally and trust energy confirm the clone node.

Keywords: Trust, Clone Attack Detection, Received Signal Strength, Mobile Wireless Network.

INTRODUCTION

Mobile Ad hoc Networks (MANETs) have an important position in 4G networks in addition to ad hoc networking potentialities are predictable to turn into a major element of future wireless network functionalities. MANET’s are formed by self-governing mobile nodes dynamically without utilizing a centralized management which is connected via wireless links. The nodes are permit to move anywhere freely as well as systematize them in the network; therefore, the wireless network topology might vary quickly and randomly. The greatest advantage of MANETs is the portability or the mobile nature of the nodes. But, the node mobility induces repeated changes of the network topology also causes high transmission error probability.

MANETs are usually more susceptible to information and physical protection intimidation than wired networks. The shared and open broadcast channels which are in the form of wireless used nodes with insufficient corporal safety are level to safety intimidation. Also, MANET is a disseminated infrastructure less network, it trusts on separate protection resolution from each mobile node, as centralized security control is inflexible to realize. A few key protection necessities in ad hoc networking contain: access control, data integrity, Denial of Service (DoS) and confidentiality.

Quality of Service (QoS) assurances is necessary for victorious transmission of network traffic of the multimedia. The important task for QoS routing is to discover a possible route through the networks. QoS supplies usually accredit to a large group of metrics together with error rate, delay, jitter, throughput, loss of packet etc. MANET characteristics with constraints are vigorously varying the topologies of the network, capabilities of a node, link variation and bandwidth link is restricted and superiority in a MANET. QoS necessities are invariably ignored.

RELATED WORK

Location Claim Approach method is introduced that is base on network operation of a clone discovery protocol. Each node’s sends the location and ID of the nodes to other nodes to sense the clone nodes in a predestined region [1]. The needless transmitting of position assert among the sensor nodes would enlarge the computation overhead, claim storage and communication overhead. The proposed method is used to overcome the exploitation location more exact. At last the whole energy utilized by the projected scheme is very low.

The distributed node clone finding method is analyzed in this paper. Even though there are numerous
protocols in novel projected for node clone discovery, but some efficient protocol only discussed in this paper like LSM and RED. These protocols are under the group of observer base node clone discovery [2]. At initially, analyzed the memory, detection level, and energy overhead of proposed protocol, RED and LSM. Therefore offered an approach for the optimization of observer based node clone discovery.

Wireless Networks are susceptible to attack of clone like they are deploying in the aggressive, disregarded surroundings. Owing to the shortage of considerable interfere conflict, a rival can simply detain, sensor nodes are concession and then duplicating them, random amount of clones are insert into the network. Numerous solutions are projected in the novel for discovery of this clone from that satisfactory result has been shown. Random Walk (RAWL) is the observer nodes base distributed method [3]. In which witness nodes are arbitrarily chosen by starting numerous random walks all over the network. Even though RAWL have gained more security of observer nodes except in accomplish elevated discovery prospect RAWL suffer from the memory overhead and elevated communication. Simulation outcomes indicate that reduces the memory costs and communication but also provides high security.

Wireless networks are easily attacked by: eavesdropping, Denial of service, intrusion. These problems can be prevented by using cryptographic resources, the node duplication attack, also known as “clone attack”. Numerous studies have resolute on techniques to sense the clone attacks and a variety of protocols have resulted. Mobile assisted Clone Detection method (MCD) [4] which is a hybrid protocol efficient and effective resistant in opposition to two sensible adversary models: the persistent adversary and the vanishing and provides high discovery rate, while incur restricted overhead.

The cost constraints and hardware of sensor nodes. However, make sensors level to clone attacks and pose huge challenge in the plan and exploitation of an energy-efficient WSN. A location-aware clone detection protocol is proposed [5], which guarantee victorious clone attack discovery and has tiny pessimistic impact on lifetime of the network. Particularly, we consume the information of the sensors location and arbitrarily choose a witness node which is located in a ring area to confirm the isolation of sensors and to sense clone attacks.

A novel security algorithm has been proposed in this paper to afford data privacy by shielding the network from different attacks. In this algorithm, a unique number is assigned for each node. Based on this unique number each node is encrypted and decrypted the sensed data [6].

Mobile MWSN is normally categorization in cruel weather, particularly disregarded devoid of any tamper-resistant equipment; thus an aggressor is able to simply detain the sensor node in an extremely narrow period. A centralized and distributed node duplication attack discovery process is proposed for MWSN [7]. The projected scheme has two protection techniques that is security control and attack discovery. Performance estimate demonstrate the efficiency of detection method in MWSN environment.

Wireless Networks are susceptible to duplication attacks of node owing to exploitation in disregarded surroundings, the deficiency of corporal interfere conflict. An opponent can simply detain, sensor nodes are negotiation and then duplicating it, insert random amount of copy in the network to scale large diversity of internal attacks. A novel distributed solution (RAND) is proposed for discovery of duplication attack of the node that combine network division with random walks and operates in two parts. Network organization part is the first part; the whole network is separated hooked on dissimilar regions. Replica discovery phase is the second part, by claimer-reporter-witness structure the clones are sensed and then an arbitrary walks are employed inside every region for the election of observer node. Simulation outcome shows that increase in the performance of the witness node with memory overhead and moderate communication [8].

Trust and Mobility based Clone Attack Detection in Mobile Wireless Network: Trust and Mobility based Clone node Detection (TMCD) scheme isolate the clone node by energy trust and node received signal strength.

Received Signal Strength based Clone Detection: The Received Signal Strength (RSS) is utilized to confine nodes thus recognizes attacks because this approach take that every node position could be vault by a distinctive and different individuality. In this network, the RSS is used to estimate the space among the two nodes.

In this part, the RSS is used to sense duplication and Sybil attacks. Owing to the decrease of systematization individuality organization and management in the ad
hoc networks in which the nodes does not have any knowledge about the isolated neighbors at the nth hop, in the subsequent clause, we would plan non-local and local discovery strategy.

In this scheme, every node captured RSS with a time table as of entire neighboring node. Additionally, every node observes as well as reports the RSS which is established as of each 1-hop neighbor. If whichever two consecutive messages of RSS so as to initiate from similar individuality, the message obtained node require to establish if the messages are obtained from the similar legal node otherwise as of two different nodes having similar identity.

**Figure 1: Example Mobile Ad hoc Network**

The Figure 1 demonstrates that the node 6 obtains messages 2 and 7 at times t1 and t2, correspondingly, since similar individuality. At this time, node 6 wants to find out whether the messages obtained from one node dislocated as of one position to other with the induce vary in distance as of d1 to d2 otherwise as of two dissimilar nodes. In that situation, one would be trustable and another one is a clone node.

**Energy Trust based Clone Detection:** Energy utilization factor is a significant parameter in the network. A clone node typically transmits or obtains additional data packets than an ordinary node. Therefore, it will certainly utilize additional energy. The source node S observes the energy utilization of its neighboring nodes and checking node on particular time period. The difference of energy utilization of node i can be computed by:

\[
D_{EU}(t) = \frac{\Delta EU_i(t) - \Delta EU(t)}{\Delta EU(t)} \quad \text{... (1)}
\]

Where

\[
\Delta E_i(t) = EU_i(t - \Delta t) - EU_i(t)
\]

\[
\Delta E(t) = \frac{1}{h \sum_{i=1}^{h} \Delta EU_i(t)} \quad \text{... (2)}
\]

\[t \rightarrow \text{time period}\]

\[\Delta EU(t) \rightarrow \text{average energy utilization of all neighboring nodes of S}\]

\[h \rightarrow \text{Neighboring nodes count of S.}\]

Node S approximately judges the energy utilization of its neighboring nodes during particular time through observing their data communication activities. The difference of energy utilization is lesser the node trustiness.

If the difference of energy utilization is a lesser amount otherwise equal to 0 that represents the observed node is trustworthy. If the energy utilization of the observed node energy difference is larger than or equivalent to 1, or additional than twice otherwise two times the average energy utilization, the observed node is an untrustworthy.

**Performance Evaluation:** The performance of the projected method is examined by the Network simulator. The simulation of the projected method has 50 nodes disposal in the simulation region 800×800. The nodes are communicated with others by the help of communication protocol User Datagram Protocol.

**Average Delay:** The difference of time among the current packets received and the previous packet received is called Average Delay. It is calculated by the equation 3.

\[
\text{Average Delay} = \frac{\sum_{n=0}^{n} \text{Pack Recvd Time} - \text{Pack Sent Time}}{n} \quad \text{... (3)}
\]

**Figure 2 Average delay of MCD and TMCD**
Figure 2 indicates that the range of delay is small for the projected method TMCD than the presented method MCD. The throughput value is larger means that of delay value is smaller in the network. The delay in the network may lead to lose the information. The information must not get lost because of the delay factor, therefore proper sharing is required in this phenomenon during data transmission.

**Throughput:** The average of victorious messages sends to the base station. The throughput is calculated using equation 4.

\[
\text{Throughput} = \frac{\sum_{n}^{n} \text{Pkt Received}(n) \cdot \text{Pkt Size}}{1000} \quad \ldots (4)
\]

**Residual Energy:** The quantity of remaining energy in a node at the present case of time is called as residual energy. In the network operations the rate of consumed energy is calculated by the residual energy.

Figure 4 indicates that in the network the residual energy is enhanced for the projected method TMCD when compared with the presented method MCD. In TMCD, reduce the node will be dead also As long as there is residual energy, the network would have an enhanced network lifetime in the network.

**CONCLUSION**

Owing to the need of systematization individuality administration, the transmit character of Mobile wireless network, clone attacks are forever attractive. This attacker can make numerous clone identities on their physical devices. In this projected method, the perceive signal strength is used and energy trust for the discovery devoid of using additional devices and trusted third party. Ahead the discovery of hateful identity, they would be ostracize and sequestration. The received signal strength captures the clone attacks locally and trust energy confirm the clone node.

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Unfailing Secure Data Aggregation Protocol in Wireless Sensor Networks

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ABSTRACT
In wireless sensor network (WSN), security is an essential as well as difficult mission. Data aggregation process is checking of duplication of data after encryption, overhead due to encryption etc. The integrity, data privacy in addition to security issue in data aggregation turn into very important when the sensor network is disposal in an aggressive surroundings (eg., battle field). To solve this problem, Unfailing Secure Data Aggregation Protocol (USDA) in WSNs is projected. Here, Extended Kalman filter (EKF) method is used to sense fake data which is to be inserted. In this scheme, particularly by observing behaviors of data aggregator in addition to using EKF to forecast their authentic in-network gathered values, every node focus at fixing up a standard range of the neighbors’ prospect transmit gathered ranges. This is a difficult work since potential elevated packet loss rate, harsh environment, and sensing uncertainty. By using dissimilar gathering functions such as min, sum, average, and max likelihood ratio to increase detection sensitivity.

Keywords: Secure Data Aggregation, Extended Kalman Filter, Clustering, Energy Efficiency, Wireless Sensor Network

INTRODUCTION
Wireless Sensor Networks contains numerous sensor nodes that used in the varied regions like health care, spatial exploration, environment monitoring, military surveillance, industrial monitoring, and etc to detect events. In WSNs, data aggregation is an essential function to collect vital information from all sensor nodes. Then collected information is aggregated and transmitted to a Base Station. The aggregation function is for removing the information redundancy and minimizing the energy utilized in unnecessary communications.

However, this aggregated function creates collusion, energy consumption and delay. Reducing the information gather delay, explicitly the instance for secure gathered information to achieve the BS is significant application which is necessary. A number of existing aggregation scheduling protocols that reduce the energy utilization is projected. But, they endure as of the raise in data quiescence since former to the gathering process; every node must stay for an instance for getting information from another sensor node. Secure data assists to BS accepts the significant information from sensor nodes and the early detection of events.

Also minimizing energy utilization is a primary problem to activate WSNs for an extended period because sensor node is usually charged by non-rechargeable battery with restricted ability. To resolve the above difficulties, Unfailing Secure Data Aggregation Protocol in Wireless Sensor Networks is proposed. In this scheme, the extended kalman filter mechanism isolates fake information inserted node. Thus the BS reaches secure aggregated data from the sensor in WSN.

RELATED WORK
A WSN has numerous sensor nodes which are deploy into a destructive location to examine as well as documentation the change that occurs in particular parameter of surroundings. Later like a concession an opponent can duplicate a little sensor node, put in random amount of replica in the field networks to weaken the network process. Therefore, numerous clone discovery protocols are projected to enhance the security and lifetime of the WSN. These are base on detection ranges, device types, discovery methods and deployment strategies and strive to alleviate the hazard in opposition to WSN.
Delay-Efficient Data Aggregation Scheduling [2] is used to make the collusion free network. This system includes two parts. In earliest part, an equilibrated straight pathway tree is constructed as a aggregation tree. In following part, scheduling mechanism to make a non-collision for aggregating information of network. Distributed Data Aggregation Scheduling (DDA) algorithm [3] makes a non-collision schedule for collecting information in the network. Information aggregation is a significant factor in WSN as well as aggregation scheduling possible method of enhancing the aggregation worth. The greedy strategy is reduced the data aggregation scheduling time.

Self-Learning-Based Data Aggregation Scheduling algorithm (SLDA) [4] is used for minimizing the communication delay and extends lifespan of sensor. To facilitate to recognize the disseminated calculation and self-learning, incorporate the Q-learning into the exploring procedure of an adaptive period arrangement with better effectiveness. Because of the converging environment, scheduling speedily approaches an estimated best possible series with the completing of frames.

A distributed data aggregation scheduling (DAS) algorithm [5] is used to stability energy expenditure for aggregating data. This algorithm initially makes trees fixed at nodes that are named virtual sinks and next stables the number of sibling at a specified stage to stage the energy utilization.

Delay-constrained data aggregation scheduling [6] mainly considered struggles of data aggregation scheduling and minimizing communication delay in WSNs. In this scheme, the data aggregation tree consists of two types, tree- indoor struggles and tree- outdoor struggles. Initially, scheduling communication time applies an energetic training algorithm. Next, communications with tree-outdoor struggles are avoided with greatest weight autonomous set in tree-outdoor struggle graph. This article explained how to collect and aggregate data from whole sensor nodes to the BS that energy utilization is reduced and the time latency is minimized [7].

Wireless Networks are frequently deployed in antagonistic surroundings where an opponent may physically detain some nodes, and duplicate them in a huge amount of clones, simply taking the network control. This solution cannot acclimatize to modify the size of the network and have stumpy discovery effectiveness for clone nodes. To determine the clone nodes in fast manner an improved LEACH (NI-LEACH) protocol is proposed to diminish the cluster scale by consider the nodes residual energy and the finest number of clusters [8]

Unfailing Secure Data Aggregation Protocol: In this scheme, a WSN can be split up into a quantity of groups; every cluster includes several sensor nodes and Group Head (GH). Every Sensor node can communicate to any information to Base Station (BS) or other cluster sensor nodes via CH. A CH working operation is to gather the sensing information and aggregate the gathering information then send to the BS. Finally, communicate the aggregated information to BS directly or through GHs.

While a normal sensor node is compromised through a malicious, thus this malicious node handles the compromised node. It can insert modified information reads into the WSN. As a result the modified original data can seriously disrupt aggregation operations. This proposed scheme contains four phases such as Clustering phase, Aggregation Scheduling phase, Duty Cycle phase and Data Transmission phase.

Grouping Phase: The WSN includes numerous static sensors nodes and these sensors are built into groups. The groups are created by its distance. Sensor nodes are initially having same amount of energy and limited communication range. Each group has a Group Head (GH) and the GH is act as a leader of the group members. The CH is selected by remaining energy of the sensor node. Every CH collects sensing data from the cluster members then it aggregates sensing data. Data is aggregated by aggregation scheduling. Figure 1 demonstrates the illustration of grouping phase in WSN.

![Figure 1: Illustration of Grouping Phase](image-url)
Secure Data Aggregation Phase: In this scheme, an Extended Kalman filter (EKF) established to identify false inserted data. This scheme Malicious Node Observation (MNO) phase and System Observation (SO) phase integrates to form the secure WSNs. The MNO function is detects the malicious node and SO phase is using the EKF mechanism to monitoring the sensor behaviors for predicting future states. Particularly, by observing activities of its adjacency and utilizing EKF to forecast their upcoming states, every node intends at surroundings up a usual rate of the adjacency future communicated aggregated values.

Here, the sensor nodes update the states value periodically. The system status is predictable by discrete times $t_k \in 0, 1, \ldots$ etc.

Actual future state value is compute in equation (1) development of this procedure

$$X_{k+1} = F(x_k) + W_k$$

Where, $F$ function links the status at time period $t_k$ to the status at time period $t_{k+1}$.

Thus, MNO and SO phases require incorporating with work efficiently in the WSN.

RESULT AND DISCUSSION

The performance of the projected method is examined by the Network simulator. The simulation of the projected method has 100 nodes disposal in the simulation region $500 \times 500$. The nodes are communicated with others by the help of communication protocol User Datagram Protocol.

Average Delay: The difference of time among the current packets received and the previous packet received is called Average Delay. It is calculated by the equation 2.

$$\text{Average Delay} = \frac{\sum^n_{i=1} \text{Pack Recvd Time} - \text{Pack SentTime}}{n} \quad \ldots (2)$$

Throughput: The average of victorious messages sends to the base station. The throughput is calculated using equation 3.

$$\text{Throughput} = \frac{\sum^n_{i=0} \text{Pkts Received}(n) \times \text{Pkt Size}}{1000} \quad \ldots (3)$$

Residual Energy: The quantity of remaining energy in a node at the present case of time is called as residual energy. In the network operations the rate of consumed energy is calculated by the residual energy. In this scheme, the initial energy is 10J. After finishing the simulation, the sensor node remaining energy of USDA method is 9.9 J and SLDA method is 9.85J.
Figure 4 indicates that in the network the residual energy is enhanced for the projected method USDA when compared with the presented method SLDA. In USDA, reduce the node will be dead also. As long as there is residual energy, the network would have an enhanced network lifetime in the network.

CONCLUSION

In this paper, Unfailing Secure Data Aggregation Protocol in WSN is proposed. This scheme contains two phases such as Malicious Node Observation phase and System Observation phase integrates to form the secure WSNs. The MNO function is detects the malicious node and SO phase is using the EKF mechanism to monitoring the sensor behaviors for predicting future states. The benefits of this scheme to minimize the much amount of energy utilized by the entire network also discover the data packet reaching rate.

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A Pepped-Up Fir Filter Architecture for Secure and Update Applications in Digital Wireless Communication System

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ABSTRACT

In Digital wireless communication system Finite Impulse Response (FIR) filter is used fundamentally pipelined as well as support Multiplication with Accumulation scheme (MAC) that results in important save of calculation. Efficient area along with delay recognition of great order FIR filters for update applications have been achieved by the opportunity of recognition of block FIR filter in transpose form organization. The projected transpose form block filter of update applications are developed by a general carry select adder based architecture. Secured digital FIR filter block is implemented by a pepped-up design using the MAC scheme. Booth multiplier has been used in MAC scheme. The proposed method has less area also delay than conventional filter.

Keywords: Finite Impulse Response (FIR) filter, Multiplication and Accumulation (MAC), Booth Multiplier, wireless communication.

INTRODUCTION

Wireless communication is the transfer of digital data from transmitter to receiver without conductor like space radio communication, etc. In digital wireless communication, the DSP applications FIR filter is a main concern like echo cancellation, speech processing, various communication applications, adaptive noise cancellation and Software Define Ratio (SDR) etc. Increases the filter order in linear manner which provides number of multiplications and additions are essential for their filter output. Limited battery power present in nodes of MANET and these batteries does not be replaced. These batteries are mainly used to extend or maximize the lifetime of network. In digital FIR filter no redundant calculation is obtainable. The Figure 1 illustrates the FIR filters in wireless communication system. Here the input analogy signals are amplified and converted in to the digital signal through A/D converter then converted signal gets filtered through DSP processor.

![Figure 1: FIR filter in digital wireless communication](image)

Filter coefficients are extremely frequent remain stable and defined a prior in signal processing applications. The reduced difficulty of realization of multiplications has been used in this feature. The Integrity of the Specifications configurations are direct form FIR filter and transposes form FIR filter and booth multiplier
used in MAC scheme to perform FIR filter operation. This booth multiplication algorithm multiplies 2 signed binary numbers in 2’s complement structure. Andrew Donald Booth invents the booth algorithm in 1950.

RELATED WORKS

Mohanty and Meher [1] proposed the pipelined transpose form filters support multiple constant multiplications (MCM) method which provides significant saving of computation. FIR filters in both secure and update applications achieved by the possibility of realization of FIR filter in transpose form configuration.

Trimale and Chilveri [2] FIR filter implementation on FPGA using MCM design technique. FIR filter is used to filtering its impulse response of finite duration. In some DSP applications, to meet accurate frequency specification a higher order of FIR filter is necessary. In FIR filter, input is multiplied with the set of constants which provides reduced complex multiple constant multiplication design method. It essentially shrinks the number of additions necessary for recognition of multiplication.

Park et al.,[3] explained FIR filtering is a multiplication of vectors by scalars. The performances of conventional carry save and Wallace tree multipliers in 0.35-/spl mu/m technology are compared with the proposed implementation. The sharing multiplier technique enhances speed by approximately 52 and 33% than the FIR filter executions depend on the carry save multiplier and Wallace tree multiplier. Then the sharing multiplier technique provides small power delay product than other multiplier system.

Guoand DeBrunner [4] proposed to design bit-level architectures for vector-vector multiplication with a direct application for execution of convolution performed by distributed arithmetic. In proposed systems, the coefficients is used as addresses to evaluate the LUT. Desired output least-mean-square (LMS) adaptation has been used and 2 smart LUT updating techniques are proposed.

Park et al., [5] proposed in vector-scalar products, the proposed design is depend on a computation sharing multiplier (CSHM) that particularly targets computation reprocess. The projected architectural and circuit-level methods are used develop a 10-tap programmable FIR filter which fabricated in CMOS 0.25-/spl mu/m technology. The IC contains approximately 130k transistors and occupies 9.93 mm/sup 2/area.

Rajputand Swamy [6] proposed Multiplication operation on signed numbers has been performed by the current Modified Booth Encoding (MBE) multiplier. For signed and unsigned numbers unique multiplier unit provides high speed. So, this paper proposed the design and implementation of SUMBE multiplier. Because signed and unsigned multiplication operation is achieved by the similar multiplier unit.

Wu et al., [7] developed Pipelined modified Booth multiplication and it is used to improve the power performance ratio of 2’s complement multiplication. In VLSI implementation the proposed scheme design is used. Booth multiplication reduces the number of adders required to achieve deceased power utilization. In proposed technique half of the adders are required to perform the operation than existing method.

Latha, R. and Vanathi [8] explained to eliminate the number of common expression the decimation filter architecture has proposed in digital network. This reduces the delay and power consumption.

Ojail, M., et.al. [9] Explained high performance Filter of FIR in frequency domain for third generation communication systems. This causes low cost modules capable of filtering and FFT to use wide variety of wireless communication.

Xiao-Ying, H et, al., [10] described the constrained LS (CLS) design of quadrant ally symmetric 2-D FIR filters and presents a computationally efficient algorithm for the design, which reduces the magnitude error of the filters.

Rajput, R.P. and Swamy [11] M.S., explained the design and implementation of SUMBE multiplier. The modified Booth Encoder circuit generates half the partial products in parallel. This reduces the power dissipation, cost, area and delay.

Jain, G., et.al., [12] the approximate Booth Multiplier has been designed which works on error tolerant multiplication (ETM) technology and provides high performance for the DSP application. This increases the speed.

BOOTH MULTIPLICATION ALGORITHM

Booth algorithm is a multiplication algorithm that multiplies 2 signed binary numbers in 2’s complement notation as shown in Table 1.
Table 1: Multiplication of Booth algorithm

<table>
<thead>
<tr>
<th>A</th>
<th>Q</th>
<th>Q-1</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>0100</td>
<td>0</td>
<td>Initial</td>
</tr>
<tr>
<td>0000</td>
<td>0010</td>
<td>0</td>
<td>&gt;&gt;</td>
</tr>
<tr>
<td>0000</td>
<td>0001</td>
<td>0</td>
<td>&gt;&gt;</td>
</tr>
<tr>
<td>0110</td>
<td>0001</td>
<td>0</td>
<td>Add</td>
</tr>
<tr>
<td>0011</td>
<td>0000</td>
<td>1</td>
<td>&gt;&gt;</td>
</tr>
<tr>
<td>1101</td>
<td>0000</td>
<td>1</td>
<td>Sub</td>
</tr>
<tr>
<td>1110</td>
<td>1000</td>
<td>0</td>
<td>&gt;&gt;</td>
</tr>
</tbody>
</table>

This multiplier includes adder function, partial product generator (PPG) and improved logic of booth encoder concept. Let us consider B is the number of multiplier bit and A is the multiplicand bit then (AXB) produces B partial product and (A+B) product as figured in Figure 2. Also in this we are using carry select adder (CSLA) to get the final product. The projected 16 bit multiplier produces 16 partial products can be reduced to 8 by using booth encoder logic which shrinks the area and power.

FIR FILTER

Direct form FIR filter has delay elements and MAC unit to establish the finite impulse response. Figure 3 shows the block diagram of ‘n’ tap digital direct form FIR filter. X(n) and Y(n) represents the input and output signals and the filter coefficients are C_0, C_1, C_2,… C_n. 8-bit data samples and filter coefficients are considered here and 8-bit data samples multiplied with filter a coefficient that provides 16-bit data. Finite impulse responses achieved by the 16-bit addition data of every tap will be accumulated. The proposed booth multiplier used in this FIR filter which provides reduction in power, area utilization of a system.

RESULT AND DISCUSSION

Verilog HDL is used to complete the projected pepped-up fir filter architecture for secure and update applications. ModelSim 6.3c has been used to estimate the simulation results and Xilinx ISE 10.1i used to evaluate Synthesis Performances. Figure 4 shows that the simulation results of projected pepped-up FIR filter design for secured and update applications in wireless communication. Also Table 2 shows the Comparison of existing FIR filter and proposed FIR filter using Booth Multiplier, in this the proposed FIR filter is reduces the area and delay.
Table 2: Comparison of existing FIR filter and proposed FIR filter using Booth Multiplier

<table>
<thead>
<tr>
<th>Parameters</th>
<th>LUTs</th>
<th>Slices</th>
<th>Delay(ns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIR filter</td>
<td>804</td>
<td>428</td>
<td>41.271</td>
</tr>
<tr>
<td>FIR filter using Booth Multiplier</td>
<td>739</td>
<td>395</td>
<td>38.480</td>
</tr>
</tbody>
</table>

**CONCLUSION**

In this paper, an implementation of pepped-up FIR filter architecture for secure and update applications in digital wireless communication system has been proposed and this method compared with existing router using booth multiplier. The simulation result of FIR filter shows the reduction in area and delay of a system. It presents 6.7% of delay deceased when compared to the conventional routing method. Moreover it offers 8.9% fall in LUT and 7.7% reduction in slices used in the design.

**Ethical Clearance:** CMR Institute of Technology

**Source of Funding:** Self

**Conflicts of Interests:** Nil

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Analysis of Emotional States in Parkinson’s Disease using Entropy, Energy-Entropy and Teager Energy-Entropy Features

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ABSTRACT

In this paper, Emotional recognition in Parkinson’s disease (PD) has been analyzed in both time and frequency domain using Entropy, Energy-Entropy and Teager Energy-Entropy features. Classification results were observed using three classifiers namely Probabilistic Neural Network, K-Nearest Neighbors Algorithm and Support Vector Machine. Emotional EEG stimuli such as happiness, sadness, fear, anger, surprise, and disgust were used to categorize the PD patients and healthy controls (HC). For each EEG signal, the alpha, beta and gamma band frequency features are obtained for six different feature extraction methods (Entropy, Energy-Entropy, Teager Energy-Entropy, Spectral Entropy, Spectral Energy-Entropy and Spectral Teager Energy-Entropy). The proposed Energy–Entropy feature performs evenly for all six emotions with accuracy of above 80% when compared to other features, whereas different features with classifier gives variant results for few emotions with highest accuracy of above 95%.

Keywords: Electroencephalogram, Emotions, Multimodal stimulus, Non-linear methods, Parkinson's disease, Spreadfactor, Teager Energy Entropy.

INTRODUCTION

Electroencephalograph (EEG) signals or brain signals are used widely in many applications such as to diagnose epilepsy, sleep disorders, depth of anesthesia, coma, encephalopathy, and brain death and also for detecting tumors, stroke and other focal brain disorders as front line method. Other applications like developing brain machine interface using motor signals and Parkinson’s individuals emotional recognition were researched diversely in recent years. In patients, emotional processing with disorder were analyzed using neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) and these techniques helps to identify the specific region of emotional functions[1]. It is also noted that the right hemisphere is involved with positive emotions such as happiness and surprise and the left hemisphere is involved with negative emotions such as sad, anger, fear, and disgust[2]. Various researchers have shown their interest on motor and cognitive impairments in neurological disorder people. Later on, researchers have focused on investigating the emotional conditions in people with neurological disorders[3].

PREVIOUS WORK

In the previous study, researchers have focused emotional investigations in various neurological disorders such as Parkinson’s disease, Stroke, Huntington’s disease, and Alzheimer’s disease. In this article, we focused and reviewed on emotional recognition of Parkinson’s disease individuals. Patients with Parkinson’s disease (PD) have central nervous system disorder which affects motor system with low voluntary muscle controls, sleep issues and behavior problems. Such people lead to depression and anxiety with high emotional behavior. PD individual’s emotional states and their abilities in recognition of emotion were analyzed in this study.

Rajamanickam Yuvaraj et al. analyzed two groups of subjects, twenty PD patients and thirty healthy controls were used to acquire EEG data. The multimodal stimuli relating to six emotional states (happiness, sadness, fear, anger, surprise and disgust) were used in the study. The combination of picture and sound were presented in a random manner. The frequency spectrum bands (theta, alpha, beta and gamma) were extracted from the EEG signal. Inter hemisphere coherence for negative
emotions were lower for PD patients compared with healthy controls. No significant differences were found in positive emotional states.

In PD emotion investigation, researchers have used various analyzing techniques based on EEG signals using visual stimuli, audio stimuli, audio-visual stimuli and speech prosody analysis. In early stage of PD emotion analysis, various researches were conducted on analyzing right-hemisphere disease (RHD) individuals and left-hemisphere disease (LHD) individuals[4][5]. Later five distinct emotional studies were conducted such as happiness, (pleasant) surprise, anger, disgust, and sadness and emotional data were recorded using unfamiliar face expressions[6-9]. Further few researchers analyzed on six emotional studies (happiness, sadness, fear, anger, surprise, and disgust) on PD and HC individuals [10-12].

FEATURE EXTRACTION

Data description: Database of twenty non-demented PD patients and 20 healthy controls viewed emotional stimuli with fourteen-channel EEG recording were used in this study (Yuvaraj et al., [2016]). Twenty non-demented PD patients (10 men and 10 women) and 20 healthy controls (9 men and 11 women) matched for age (range from 40 to 65 years), education level, and gender participated in the study. The PD patients were recruited through the Neurology Unit outpatient service at the Department of Medicine of the Hospital University Kebangsaan Malaysia (HUKM) medical center in Kuala Lumpur, Malaysia. All of them had been diagnosed with idiopathic PD by a neurologist. Patients who had coexisting neurological disturbances (e.g., epilepsy, stroke) or who had undergone deep brain stimulation were not included in the study. The HC participants were recruited through the hospital community and/or from relatives of PD patients.

Feature Extraction Process

Figure 1 shows the feature extraction processes and are analyzed in time and frequency domains with six features namely Entropy, Energy-Entropy, Teager Energy-Entropy, Spectral Entropy, Spectral Energy-Entropy and Spectral Teager Energy-Entropy. First the raw EEG data was preprocessed and then feature extraction was performed. The recorded signals were segmented into number of frames with a overlapping of 75% [13]. Each frame has 1280 samples (corresponding to 10 second). The segmented signals were then filtered using passband elliptic filters and the alpha (7 to 14 Hz), beta (14 to 21 Hz) and gamma (21 to 34 Hz) from all the 14 channels [1][14] were obtained.

Entropy (EN) value is calculated using the Shannon entropy. From the filtered values, the entropy feature is calculated using the Equation (1),

\[ H^k_x = -\sum_{q=1}^{N} [x^k_x(q) \ln(x^k_x(q))] \]  

Energy-Entropy (EEN) value is calculated using the power values of Shannon entropy. From the filtered values, the EEN feature is calculated using the Equation (2),

\[ S^k_y = -\sum_{q=1}^{N} [(x^k_y(q))^2 \ln(x^k_y(q))^2] \]  

For Spectral Entropy (SEN) feature extraction process, from the filtered values, \(x(q)\) were first Fourier transformed to using the Equation (3),

\[ Y^k_y = \sum_{q=1}^{N} x^k_y(q) w_n^{(q-1)(1-1)} \]  

where \(n\) is the complex exponential and \(N\) is the total number of data in the filtered signal. From the Fourier transformed signal, the SEN value is calculated using Equation (4),

\[ H^k_y = -\sum_{m=1}^{N} Y^k_y(m) \ln(Y^k_y(m))] \]  

where \(N = 128\), is the number of samples.

Then the Spectral Energy-Entropy (SEEN) value is calculated using the power values of Spectral entropy. From the filtered values, the EEN feature is calculated using the Equation (5),

\[ S^k_y = -\sum_{m=1}^{N} [(Y^k_y(m))^2 \ln(Y^k_y(m))^2] \]  

Teager Energy (TE) is a powerful nonlinear operator proposed by Kaiser, capable to extract the signal energy
based on mechanical and physical considerations. The continuous form of the TE is given as

$$\phi_t[y(t)] = \left(\frac{d^2}{dt^2} y(t)\right)^2 - y(t) \frac{d^2}{dt^2} y(t)$$

Then the Proposed Teager Energy-Entropy (TEEN) is of the TE is calculated using Equation (6)

$$H_{\text{TEEN}}^q = \sum_{q=1}^{N} [\phi y^q (q) \ln(\phi y^q (q))]$$

For the Fourier transformed signal, Spectral Teager Energy Entropy feature (STEEN) is calculated using Equation (7),

$$H_{\text{STEEN}}^q = \sum_{q=1}^{N} [\phi Y^q (m) \ln(\phi Y^q (m))]$$

Similarly, the features corresponding to the PD and HC performed by all the twenty subjects (for all trials) were extracted using fourteen channels. Each frame has 42 (14 channels x 3 bands) feature values and it is given as input to the network.

FEATURE CLASSIFICATION

K-Nearest Neighbor Algorithm: In pattern recognition, the k-nearest neighbor algorithm (KNN) is a non-parametric method used for classification and regression. In KNN classification, the output is a class membership. An object is classified by a majority vote of its neighbors, with the object being assigned to the class most common among its k nearest neighbors (k is a positive integer, typically small). If k = 1, then the object is simply assigned to the class of that single nearest neighbor. For this KNN model same 42 input values were given and the accuracy results of each emotion (happiness-E1, sadness-E2, fear-E3, anger-E4, surprise-E5, and disgust-E6) and the corresponding smoothing parameter (K) ranges from 1 to 10 were found.

Probabilistic Neural Network: To discriminate the PD and HC for six different emotions, probabilistic neural network (PNN) has been developed. PNN is a supervised neural network proposed by Donald F. Specht [15][16] and it is a kind of radial basis network suitable for classification problems. The PNN is a direct continuation of the work based on Bayesian classification and classical estimators for probability density function. The only factor that needs to be selected for training is the smoothing factor/spread factor which affects the classification accuracy. The network structure of PNNs is similar to that of backpropagation; the primary difference is that uses exponential activation function instead of sigmoid activation function and also the training time is lesser compared to multi-layer feed forward network trained by back propagation algorithm. In this paper, PNN architecture and the feature extraction process are constructed and analysed using MATLAB software. This problem requires 42 input neurons. The accuracy results of each emotion and the corresponding best smoothing parameter (K) ranges from 0.55 to 0.65 were found.

Support Vector Machine: Support vector machines (SVM) are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis[17]. Given a set of training examples, each marked as belonging to one or the other of two categories, an SVM training algorithm builds a model that assigns new examples to one category or the other, making it a non-probabilistic binary linear classifier (although methods such as Platt scaling exist to use SVM in a probabilistic classification setting).

A support vector machine is a discriminative classifier formally defined by a separating hyperplane. The algorithm outputs an optimal hyperplane which categorizes new examples. In two dimensional space this hyperplane is a line dividing a plane in two parts where in each class lay in either side. Results of SVM for all six features were found.

RESULTS AND DISCUSSION

Emotional states of PD and HC using six features were investigated using three classifiers such as SVM, PNN and KNN models. The overall classification accuracies of six features for each emotion using three models were tabulated and shown in the Figure 2, 3 and 4. For emotion E1, highest classification accuracy was obtained using TEEN feature for all three classifiers. Maximum accuracy of 99.59 is obtained using TEEN with SVM and second highest accuracy of 99.39 using EEN with SVM. For emotion E2, maximum accuracy of 90.81 is obtained using EN with KNN and second highest accuracy of 90.74 using EEN with KNN. For emotion E3, maximum accuracy of 95.07 is obtained using SEEN with KNN and second highest accuracy of 94.93 using SEEN with SVM. For emotion E4, maximum accuracy of 91.42 is obtained using SEEN with SVM and second highest accuracy of 87.16 using SEEN with KNN. For
E5, maximum accuracy of 94.53 is obtained using SEEN with KNN and second highest accuracy of 88.04 using SEN with KNN. For E6, maximum accuracy of 88.18 is obtained using SEEN with SVM and second highest accuracy of 87.43 using EN with KNN.

Figure 2: Over all results of EN, EEN, SEN, SEEN, TEEN AND STEEN features using KNN.

Figure 3: Over all results of EN, EEN, SEN, SEEN, TEEN AND STEEN features using PNN.

Figure 4: Over all results of EN, EEN, SEN, SEEN, TEEN AND STEEN features using SVM.

From the Figure 2, it could be observed that, the highest classification accuracy of 90.81% (for emotion E2) and the lowest classification accuracy of 58.65% (for emotion E1) were obtained for EN feature using KNN. Then the highest classification accuracy of 90.74% (for emotion E2) and the lowest classification accuracy of 81.15% (for emotion E1 & E4) were obtained for EEN feature using KNN. For TEEN feature using KNN, emotion E1 gives highest of 90.47% and emotion E3 gives lowest classification accuracy of 60.74%. For SEN using KNN, the highest classification accuracy of 90.2% (for emotion E2) and the lowest classification accuracy of 80.68% (for emotion E4) were obtained. Then for SEEN using KNN, the highest classification accuracy of 95.07% (for emotion E3) and the lowest classification accuracy of 58.85% (for emotion E1) were obtained for SEEN feature using KNN.

For STEEN feature, emotion E1 gives highest of 84.32% and lowest of 62.09% for emotion E4.

From the Figure 3, it could be observed that, the highest classification accuracy of 90.68% (for emotion E2) and the lowest classification accuracy of 56.49% (for emotion E1) were obtained for EN feature using PNN. Then the highest classification accuracy of 87.97% (for emotion E3) and the lowest classification accuracy of 80.07% (for emotion E1) were obtained for EEN feature using PNN. For TEEN feature using PNN, emotion E1 gives highest of 96.28% and emotion E3 gives lowest
classification accuracy of 66.82%. For SEN using PNN, the highest classification accuracy of 95.97% (for emotion E1) and the lowest classification accuracy of 67.69% (for emotion E3) were obtained. Then for SEEN using PNN, the highest classification accuracy of 96.8% (for emotion E1) and the lowest classification accuracy of 64.2% (for emotion E3) were obtained for SEEN feature using PNN. For STEEN feature, emotion E1 gives highest of 92.2% and lowest of 65.95% for emotion E4.

From the Figure 4, it could be observed that, the highest classification accuracy of 99.22% (for emotion E1) and the lowest classification accuracy of 63.78% (for emotion E2) were obtained for EN feature using SVM. Then the highest classification accuracy of 99.39% (for emotion E1) and the lowest classification accuracy of 63.65% (for emotion E4) were obtained for EEN feature using SVM. For TEEN feature, emotion E1 gives highest of 99.59% and emotion E3 gives lowest classification accuracy of 61.76%. For SEN using SVM, the highest classification accuracy of 95.54% (for emotion E1) and the lowest classification accuracy of 64.86% (for emotion E4) were obtained. Then for SEEN, the highest classification accuracy of 94.93% (for emotion E3) and the lowest classification accuracy of 57.16% (for emotion E1) were obtained for SEEN feature using SVM. For STEEN feature, emotion E1 gives highest of 94.19% and lowest of 64.86% for emotion E2.

**CONCLUSION**

The extracted features were associated to their respective emotions and the models were developed to discriminate the PD and HC individuals. The performance of the three models were tabulated and compared. In this paper, the time domain features EN, EEN & TEEN and the frequency domain features SEN, SEEN & STEEN features were extracted from the PD and HC EEG signals and the results were analyzed. From the analysis, it has been clearly observed that the energy-entropy combination feature in time domain performs evenly well (above 80%) for all six emotions. Whereas other features gives lower accuracy values of below 60% for few emotions. But for emotion E1, TEEN feature gives highest for all three classifiers among the other features. Emotions such as E2, E3, E4, E5 & E6 emotions gives better performance for features EN with KNN (90.81%), SEEN with KNN (95.07%), SEEN with SVM (91.42%), SEEN with KNN (94.53%) and SEEN with SVM (88.18%) respectively. Hence, the proposed spectral energy-entropy feature in frequency domain gives better performance for all emotions but for different classifiers. For future analysis, energy entropy combination feature may perform even much better in time-frequency domain with suitable classifier model.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** NA

**REFERENCES**


Design and CFX Analysis of Radiator Fan Blade

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ABSTRACT

In the automobiles, heat of the engine is reduced by the radiators. The radiators are exchange the heat of the engine to the surroundings. The ram effect is used to generate the cooling air in the vehicle for the cooling system which in the vehicle. The fan generates the suction by the motion of the vehicle by the ram effect. In this paper, the radiator fan blade is create in different shapes by using SOLIDWORKS software. The various designs are analysis by the ANSYS workbench software. The pressure, velocity streamline and viscosity are taken from the ANSYS workbench software and also it is compare with the presently used radiator fan blade of the TATA ACE vehicle.

Keywords: Design, radiator fan blade, ANSYS, pressure and viscosity

INTRODUCTION

In the automobiles, [¹] heat of the engine is reduced by the radiators. The radiators are exchange the heat of the engine to the surroundings. It also used in the railway locomotives, [²] aircrafts and etc. The liquid coolants are helps to the radiators for effective cooling by the circulation of the liquid. Basically water based coolants are used in the internal combustion engine. And also oils are used as the coolant but it was rare case.

The radiator fan with engine was shown in the Figure 1. The ram effect is used to generate the cooling air in the vehicle for the cooling system which in the vehicle. The fan generates the suction by the motion of the vehicle by the ram effect from the [³]. This generated air is used to transfer the heat to the surroundings from the engine components by passing the airflow. The main restriction is the engine block place very closely to radiator. The radial outflow is occurred by the restriction. The design condition helps to the increase the effect of cooling to the axial flow machines.

Figure 1: Radiator Fan with Engine

LITERATURE REVIEW

The performance of the radiator fan blade is affected by the variety of reasons that reasons are studied from the Oliet et al. The radiator fan blade influence factors are temperature of the inlet, flow of the coolant, [⁴] density of the fins and also condition of the air. Both mass flow rate of the coolant and performance of the radiator fan blade are affected by those factors. To increase the capacity of the cooling is possible by the increasing of coolant flow and air flow. The cooling quantity is decreased by the high temperature input. For the higher heat transfer rate decreased the fin spacing between another fins. Fin density may be increased till it blocks the air flow and heat transfer rate reduced.

The automotive radiator fan blade distribution of air flow was studied from the CFD simulation of Sulaiman et al. the first thing is boundary condition which means surroundings of the radiator and geometry of the radiator fan. From the simulation, [⁵] 10 m/s air outlet velocity and the same time error in the air velocity are find out. There is 12.5 percentages of difference acts between the blade shapes and tip shapes. This study was done by the CFD simulation of fan blade design. By the change the fan hub shape by aerodynamic the performance of the radiator is increased.
MATERIAL AND METHODOLOGY

The Table 1 shows the material details of the radiator fan blade. And also its dimensions and specifications are shown in the Table 1. By using these specifications the radiator fan blade is design by the SOLIDWORKS software. The created 3D model is analysis by the ANSYS workbench software. in the analysis, CFD tools is selected for this fan blade. By changing the shape of the fan blade it is analysis in the ANSYS workbench 15.0. Finally all results are compared with each other.

<table>
<thead>
<tr>
<th>Fan Designation</th>
<th>LPF</th>
<th>HPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip Diameter (mm)</td>
<td>487</td>
<td>487</td>
</tr>
<tr>
<td>Number of Blades</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Operating speed</td>
<td>2150</td>
<td>1990</td>
</tr>
<tr>
<td>Design Flow rate (m³/s)</td>
<td>1.128</td>
<td>0.804</td>
</tr>
<tr>
<td>Design Pressure rise (Pa)</td>
<td>230</td>
<td>270</td>
</tr>
<tr>
<td>Design Power (W)</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Chord Length (mm)</td>
<td>56</td>
<td>63</td>
</tr>
<tr>
<td>Stagger Angle</td>
<td>71.4°</td>
<td>76.4°</td>
</tr>
<tr>
<td>Airfoil Profile</td>
<td>DLR-2</td>
<td>DLR-2</td>
</tr>
</tbody>
</table>

DESIGN

The radiator fan blade was shown in the Figure 2. The radiator fan blade is created by the SOLIDWORKS software. The dimensions and specifications are taken from the present vehicle radiator fan blade. The created design was 3D model radiator fan blade with four leafs. The created 3D model is modified from the present TATA ACE vehicle radiator fan blade.

ANALYSIS

The created 3D model of the radiator fan blade was converted in to step file for the analysis. The ANSYS workbench 15.0 is used to analysis the radiator fan blade. In this paper, the CFX tool is selected to analysis the performance of the radiator fan blade. The created 3D model in step format is import to the ANSYS workbench. The Figure 3 clearly shows, the all steps involves in the analyzing of radiator fan blade in the ANSYS workbench.

Mesh: The fan blade was created with the wall in the SOLIDWORKS software. The created model was separated more number of nodes and elements by the mesh. The fine size and smooth mesh is used for the radiator fan blade. The meshing of the radiator fan blade with wall was shown in the Figure 4.

Boundary conditions: After the meshing, the boundary conditions are applied in the radiator fan blade. The wall conditions and input air conditions are given in this step. The boundary conditions of the radiator fan blade were shown in the Figure 5. The created radiator fan blade was placed in the centre of the camber. It was clearly shown in the below figure.
RESULT AND DISCUSSION

Velocity Streamline

The velocity streamline of the radiator fan blade was shown in the Figure 6(a) and Figure 6(b). The radial direction velocity stream and linear direction velocity streamline are shown in the Figure 6. The various color lines are shows the safe level of the radiator fan blade.

Pressure: The air pressure in the radiator fan blade was shown in the Figure 7. The lines are shows the pressure line acts over the radiator fan blade. The colour bar is indicates the various levels of the air pressure. The red color indicated the maximum pressure point in the radiator fan blade and the blue colour indicates minimum pressure point in the radiator fan blade.

CONCLUSION

The radiator fan blade was successfully designed by the SOLIDWORKS software by the dimensions of the TATA ACE vehicle radiator fan blade by the reverse engineering method. The design was modified and its export to the ANSYS workbench 15.0. The radiator fan blade was analyzed successfully by the CFX tool in the ANSYS workbench 15.0. The results are compared with the presently used shape radiator fan blade. By the comparison, the modified radiator fan blade has good viscosity than presently used radiator fan blade.

Ethical Clearance: Taken from Saveetha School of Engineering

Source of Funding: Self

Conflict of Interest: NA
REFERENCES


Design and Implementation of Least Mean Square Algorithm for a New Reconfigurable FIR Filter Architecture

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ABSTRACT

Nowadays, the communications and computations has been performed by Digital Finite Impulse Response (FIR) filter. FIR filter is predominantly used in DSP applications for efficient implementations. FIR filter is able to declare a firm linear phase frequency characteristic with any type of amplitude frequency characteristic in a DSP system. A reconfigurable FIR filter architecture has been implemented using Least Mean Square (LMS) algorithm in the proposed scheme. The proposed scheme achieves better performance when compared to an existing scheme. The proposed method has been implemented in ModelSim tool and efficiency has been calculated by using the device Virtex 6 Low Power in Xilinx ISE Design Suite 12.4.

Keywords: FIR Filter, MCSD window based filter, LMS adaptive filter

INTRODUCTION

One of a familiar filter used in Digital Signal Processing (DSP) is Finite Impulse Response (FIR) Filter because of its linear phase, stability, low cost and simple structure [1]. FIR filters are mainly used for addition and shifting operations and reducing the number of addition/subtraction process [2]. A causal discrete-time FIR filter can be expressed as

\[ Z(n) = \sum_{k=0}^{N-1} b_k c(n-k) \]  

...(1)

Where,

c(n) = input signal
z(n) = output signal
N = order of filter
b_k = value of impulse response

If the coefficients of FIR filter has been used, the last bit coefficients of the filter is kept unchanged and remaining coefficients are changed to zeros, a multi-band frequency response will be obtained [3]. There are various types of FIR filter. Among those, the one used in the reconfigurable architecture is Least Mean Square (LMS) FIR filter. Least mean squares (LMS) algorithm is an adaptive FIR filter helped to finding the filter coefficients which providing the least mean square for the error signal. According to an adaptive algorithm, LMS adjusts the filter coefficients. Digital Signal Processing (DSP) tasks takes place filtering and matrix multiplication [4].

RELATED WORKS

Finite impulse response (FIR) filters have two key requirements namely Reconfigurability and low complexity employed in multistandard wireless communication systems. In this work, FIR filter architecture is adapt for various word length filter coefficients without any overhead in the hardware circuitry. The reconfigurable filters can be efficiently implemented by using common sub expression elimination algorithms [5].

The finite impulse response (FIR) filters has been implemented by a new algorithm for the multiplier blocks with low hardware requirement. This technique is also applicable to the implementation on application-specific integrated circuit (ASIC) and Structured ASIC technologies. FPGA area and cost has been reduced by minimizing multiplier block logic depth and pipeline registers [6]. Another new algorithm called non recursive signed common sub-expression elimination (NR-SCSE) has been developed for implementing a multiplier less finite-impulse response (FIR) filters. The NR-SCSE algorithm allows the designer to overcome this problem when the recursive utilization of a common subexpression generates a high logic depth into the digital structure [7].
A method by using minimum number of adders to implement FIR filters for SDR receivers. We encode the filter coefficients by using a pseudo floating-point (PFP) representation. The filter coefficients have been coded by fewer bits than traditional 24-bit and 16-bit fixed-point filters. Simulation results show that the magnitude responses of the filters coded in PFP meet the attenuation requirements of wireless communication standard specifications [8]. Digit-reconfigurable finite impulse response (FIR) filters architecture with a very fine granularity. With a wide range of precision and tap length, the architecture provides flexibility to FIR filters. FIR filter has been implemented in FPGA kit to get the better result [9-10].

**Direct Form of FIR Filter:** The direct form of FIR filter is shown in the Fig 1. Implement of any sort of frequency response digitally by finite impulse response (FIR) filter using adders, multipliers and a sequence of delays to create the filter’s output. The filter order is straight corresponding to the power consumption of FIR filter. By changing the filter order dynamically by turning off some of multipliers, the significant power savings can be achieved.

**Fig. 1: Direct Form of a Fir Filter**

Thus, whenever we changing the filtering order, the performance degradation should be considered carefully. A filter design is the process of selecting the filter’s coefficients and its length. The main goal of filter design is to set the desired pass band and stop band parameters. The two methods in new reconfigurable low complexity FIR filter are Constants Shifts Method (CSM) and Programmable Shifts Method (PSM). By this, LMS has been included to get the better result.

**Existing Reconfigurable fir Filter:** Direct form architecture of the reconfigurable FIR filter with Amplitude Detection (AD) logic is shown in Fig 2. Amplitude detector (AD) is used to detect the amplitudes of the input samples and scrap the right multiplication operations which are shown in Fig 3. The output of AD is set to “1”, when the absolute value is smaller than the threshold. In this type of filter, multiplier will be revolved on and off continuously if the amplitude of an input changes suddenly for every cycle which sustained the considerable switching activities.

**Fig. 2: An Existing Method of Reconfigurable FIR Filter**

The switching problem has been solved by Multiplier control signal decision window (MCSD) which is shown in Fig 2. By using control signal generator in MCSD, the multipliers are turned off only when number of input samples is successively smaller than and the succeeding input samples are smaller than are counted. When an input enters into the circuit, AD output is set to “1” and the counter starts to count its level. When the counter reaches its level, the control signal changes to “1”, which suggested that the successive inputs are detected and the multipliers are set to turn off.

Once the signal sets inside of the MCSD, the MCSD signal in the output side does not change and clutched the amplitude of the input. The multiplier is turned off when the amplitudes of an input and its coefficient are smaller than. In an existing method, flip-flops, AD, control signal generator and the modified gates cause area overheads. Fig 3 explained that those overheads has been accomplished by simple logic gates and a single Amplitude Detector for input monitoring. FIR filter has also been using in nonrecursive signed common subexpression elimination (NR SCSE) algorithm [11].

**Fig. 3: Amplitude Detector Logic**
Proposed Architecture of FIR Filter: LMS is an adaptive filter used to find the coefficients of the filter. Least Mean Square Adaptive FIR filter is shown in the Fig 4. LMS is the most widely used type in adaptive filter. The main feature of LMS algorithm is low computational complexity [12]. When both inputs are given to LMS algorithm block, it subtracts those values and multiplexes the required output and the next inputs. Here, one is a normal input and another one is step size. Step size is a voltage difference between one value to another value. After multiplexing, the values have been added with a delay. The final output has been the delayed value of an addition process. The required output of LMS algorithm is given as an input to the reconfigurable architecture of FIR filter.

![Fig. 4: Least Mean Square (LMS) Adaptive Filter](image)

The proposed architecture of reconfigurable FIR filter using Least Mean Square (LMS) adaptive filter [13] is shown in Fig 5. By using LMS algorithm in reconfigurable architecture of FIR filter, the total power and delay have been reduced. When compared to an existing architecture, the proposed architecture provides a better result.

![Fig. 5: Proposed Architecture of Reconfigurable FIR Filter](image)

RESULTS AND SIMULATION

The simulation part of reconfigurable architecture of FIR filter using LMS algorithm is shown in the Fig 6.

![Fig. 6: Simulation Result of proposed reconfigurable architecture of FIR filter](image)

The timing analysis of the proposed reconfigurable architecture of FIR filter is shown in the Fig 7.

![Fig. 7: Time Analysis of proposed reconfigurable architecture of FIR filter](image)

The comparison between the power and delay of an existing and proposed method is shown in Table 1.

<table>
<thead>
<tr>
<th>Methods</th>
<th>MCSD</th>
<th>LMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay (ns)</td>
<td>4.319</td>
<td>2.953</td>
</tr>
<tr>
<td>Clock Frequency (MHz)</td>
<td>231.511</td>
<td>338.638</td>
</tr>
<tr>
<td>Power (W)</td>
<td>0.268</td>
<td>0.160</td>
</tr>
</tbody>
</table>

CONCLUSION

In this work, we proposed the reconfigurable architecture of FIR filter by using LMS adaptive filter. LMS is an adaptive filter used to find the coefficients of the filter. By finding the coefficients of the filter, power and delay has been reduced and the power has been increase. This work has been implemented in ModelSim XE III 6.3c and dumped on Virtex6 lower power XC6VLX75TL-1LFF484. Hence, the proposed architecture provides high speed, low power and delay.
References

1. Dangra KH, Gawande GS. Efficient design and implementation of multiplierless FIR filter. In Computing Communication Control and automation (ICCUBEA), 2016 International Conference on 2016 Aug 12 (pp. 1-5). IEEE.


Energy Aware Efficient Cryptographic Approach for Securing Data in WSN

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ABSTRACT

Wireless Sensor Networks (WSNs) are being used globally in many areas. As the purpose of the WSN is raising at the similar rate the safety intimidation are also rising. Nodes in a WSN are vulnerable to different attacks mainly due to their unguarded communication and nature of exploitation. Therefore, the most important in such networks is to providing security. A vigorous security solution for the networks must also make possible node confirmation. But occasionally it would be an energy utilizing process. So, we require an energy efficient and safe mechanism to protected the entire network. Thus this paper, Energy Aware efficient Cryptographic Approach (EACA) for securing data in WSN is proposed. In this scheme, the dynamic mode and sleep mode of sensor to save the energy consumption in WSN. The sender side and receiver side algorithm provide the data security. Our simulation results demonstrate that improved the residual energy and throughput in WSN.

Keywords: Energy Efficiency, Cryptography Algorithm, Data Security, Wireless Sensor Networks.

INTRODUCTION

The growth of wireless sensor networks (WSNs) has just opened up a fresh and fascinating area for the design of new applications types. WSNs consist of a huge amount of tiny sensing nodes that observe their surroundings, process information if necessary and send/receive processed information to/from other detecting nodes. These detecting hubs, distributed in environment, are associated with a sink hub – in centralised systems or to other detecting nodes through a system. In centralised systems, the sink gathers sensor information to be utilized by the end client. In numerous instances, the sink is also capacity of activating detecting hubs through transmitting, by sending system strategy and control data (Le et al., 2008). Similarly as with different systems, there are three normal design challenges that highly impact the availability and profitability of the complete system: (1) utilizing system protocols to reduce control and data packets, (2) choosing the best topology by positioning hubs in the correct spots, and (3) conveying a routing method that adequately passes information through the system from the source hub to destination hub/hubs.

Distribution of hubs in the environment can be non-structural or structural. The previous is utilized when there is no control of hubs after allocation, and their solitary part is to observe the atmosphere, process the information and construct the system by identifying and interfacing with their neighbours. In the last, but, the position of every hub (both detecting and sink) is clear ahead of time. As the hubs are under control, the communication between hubs is programmable and administration and maintenance of the hubs is simpler; likewise, because a lesser number of hubs are utilized in the earth, the cost is much lesser.

As detecting nodes are commonly utilized in non-available conditions, they require to depend on their battery (and energy reaping, e.g., sunlight based cells); charging or altering of detecting nodes isn’t a choice. Consequently, one of the greatest difficulties in WSNs is saving energy; it is one of the fundamental features that identifies the lifetime of the complete system.

RELATED WORK

Radio signals are mainly used for transferring the data among two or more corporal devices in WSN. The
communication is depends on the ability of the nodes to build a multi-hop radio network. In communication system, Security is the chief concern. For reliable communication, each node must be authenticated in the network. There are lots of confirmation method like identity based signature, attribute based signature, etc. But many methods are either complex or insecure.

WSN comprise of some nodes generally called sensors or motes. These sensors gather collectively and the data is collected by observe the environments. This data is reachable only among two communicating sources [1]. Need a safe node authentication method for delivers the data among two sources to secure the data. There are lot of assured solutions but verification assumes to give the finest result between them.

A WSN exchange data among two or more physical devices with the help of radio signals, generally called nodes. Security is a chief anxiety in all communication system. In network, each node must be verified for consistent communication. There are lot of verification algorithms like public key cryptography, message authentication codes etc. But many methods are either complex or insecure. An algorithm for verification of sensor nodes in wireless sensor nodes is proposed in this paper; for verification of nodes the algorithm uses key allocation [2]. Parent only do the node authentication. Any verification node demand is sent to its parent node and it verifies the node.

A distributed method for confirmation of nodes is proposed in WSN. For the purpose of node authentication tokens are used. The sensor nodes are reasonably arranged in the form of binary tree with base station form the root node [3]. The parent node generates a token for its child node. The child nodes used the tokens for the purpose of mutual confirmation of the sensor nodes. The analysis proved it to be free from all potential security attacks and safe.

Low-overhead Encryption based Node Authentication for security solution a low overhead encryption is proposed for node confirmation. The introduced node verification method at the transmitter side consists of three modules viz. embedding of key hint, encryption, and dynamic key generation [4]. The Performance of the scheme is analyzed by cracking time and cracking probability.

Verification is important not only to data transfer operation but also useful for network organizational function in WSN. Lately data verification has been given the importance of the research area in WSN. WSN nodes are intrinsically resource inhibited: they have limited communication processing speed, bandwidth, capacity, and storage [5]. By consider all the restrictions, a dynamic and resilient mutual node authentication scheme are proposed that enhances validate the integrity of sensor nodes and safe data exchange.

Intruders are applying a variety of methods to access the confidential and sensible data from sensors. Therefore, high security measures are required to immune WSNs from different attacks. Verification is a security method that protects WSNs from broad range of defence attacks. A confirmation protocol is proposed to communally validate sensor nodes in WSNs. The protocol is depending on tokens [6]. The generated token is weight less and reduces much of storage overheads, communicational and computational. The proposed protocol is checked for its security both automatically and formally.

Secure communication is to avert a malicious trespasser from inject fake data into the network. An authentication protocol for WSNs is proposed. The integration among authentication and routing leads to two benefits. Initially, authentication is guide by routing; authenticate each other only data path nodes to the base station [7]. Redundant protocol execution is hence removed. Second, wicked nodes are not capable to utilize the proposed protocol to put in themselves into the data paths.

The Multivariate Quadratic Quasi-groups (MQQ) is computationally additional well-ordered than classical cryptosystems like Diffie-Hellman and RSA. Focus only on the authentication trouble on this paper. A verification scheme based on MQQ for WSN, sensor nodes will do joint verification [8].

Industrial IoT and WSN use restricted capacity devices, autonomous and smart in order to examine and detect industrial environment. The devices in WSNs are administrated by a controller, which should validate them previous to they connect the network. OCARI is a WSN technology offering optimized protocols to facilitate decrease the energy utilization. To improve OCARI security and make sure a vigorous confirmation
of devices, a strong verification scheme based on the One
Time Password algorithm is proposed [9]. This process is
specially intended to be implemented on devices with
computing capacities and low storage.

In [10] describes how to use the Trusted Platform
Module (TPM) to validate sensors which produce a
sensors’ area in WSN. Models of WSN in addition to
operations connected with verification in the sensors
area are existed. Furthermore, an execution of particular
operations in the sensors area is described; this includes:
the master node initialization, slave nodes registration,
and transferring of data among them. Testing environment
together with the nodes construction capable with the
TPM is described.

Energy Aware efficient Cryptographic approach for
securing data in WSN: The proposed method where
nodes assumed to send in such a path, there it could
identify a straight line limitation of WSN nodes. The
aggregate sensor fields can partition into number of
circular cluster fields. Every circular field have a focal
cluster head. The proposed topology of the hubs is in
that circular fields are in straight line sent in almost
straight line and notified in gray code sequence.

The gray code sequence is a one of the major
approaches to notify the adjoining nodes for lessened
fault in choosing the adjoining nodes. Here the nodes are
monitor the energy by maintaining a strategic distance
from repetitive information transmission utilizing sleep
wake up method.

In wireless sensor systems, sensor nodes for the
most part switch among dynamic mode and sleep mode
to diminish energy utilization. The basic practice for
saving energy is the utilization of sleep mode where
huge parts of the sensor’s modules are turned off. Really
the radio transceiver on sensor nodes is the primary
cause of energy utilization thus, it is important to keep
the transceiver in turned off mode most of the time to
lessen energy utilization.

A sensor utilizes $E_{elec} = 50\text{nJ/bit}$ to run the
transmitter or receiver hardware and $E_{amp} = 100\text{pJ/bit/}
m^2$ for the transmitter amplifier. Thus, the energy utilized
by a sensor $i$ in getting a k-bit data packet is provided by,
$E_{elec} * k$ (1) While the energy utilized in broadcasting a
data packet to sensor $j$ is provided by the equation 1

$$Txij = E_{elec} * k + E_{amp} * d_{ij} * k \quad \ldots(1)$$

Where $d_{ij}$ is the distance among hubs $i$ and $j$.

So most important necessity is to reduce the
transmission of information, for this it is imagined that
if redundant information isn’t broadcasted after that a lot
of energy sparing is conceivable.

The energy spent in transmission of a solitary bit is
provided by

$$ctx(d) = ct1 + ed1*dn \quad \ldots(2)$$

The average energy utilized by a node, is computed
utilizing the equation 3, based on the recurrence at
which messages are sent through the system, described
by $T_{msg}$. Every message exchange adds energy to the
essential expenses of the wakeup hardware ($P_{wu}$). Receiving
the message also takes $T_{msg}$ time.

$$P_{wu} = P_{wu} + F_{msg} x ((T_{tone} + T_{msg}) x PTX + T_{msg} x PRX + (N-1) x Thdr x PRX \quad \ldots(3)$$

In this scheme, the sender side algorithm and
receiver side algorithm to provide the data security in
WSN.

Sender Side Algorithm: The sender side methodology
has three sections–dynamic key generation, encryption
and embedding of key intimation which are clarified in
the following.

Dynamic Key Generation: Here two 16-bit numbers are
created with the support of the $uid$ of the sender node and
sixteen numbers dynamically created at the sender. The
key is created dynamically to lessen splitting probability
and to build breaking time for the aggressor. These 16-bit
numbers are utilized as key in the encryption algorithm.
The algorithm clarified below runs two times to create
the two 16-bit keys. The strategy is as following.

In the first running of the algorithm, the sender
node A creates a 4-bit number with the support of an
arbitrary capacity. This number is utilized to build
three more 4-bit numbers. After that from the decimal
equal of every one of these four numbers, four 4-bit
numbers are computed. Thusly, sixteen 4-bit numbers
containing the random number are built. The decimal
equivalent called these sixteen 4-bit numbers describes
the comparing bit positions in the $uid$ of $A$. Presently the
bits from the assigned positions are separated from the
$uid$ consistently and submitted in a request to make a 16-
bit number. The request in which these are positioned is
as per the following. The separated first bit from the $uid$
beginning from the LSB is positioned in LSB position
of the 16-bit number to be created, second extracted bit is positioned in the (last positioned bit + the arbitrary number)th position from the privilege etcetera.

If a specific position is previously filled after that removed bit is positioned in the following position which isn’t filled up yet. After sixteenth position i.e. the MSB position, the positioning resumes from the LSB. After arranging the bits removed from the uid of A in the above path, one of the 16-bit keys is created. In the second run, again sixteen numbers are created with the support of the four 4-bit numbers computed during first run. After that following a similar strategy clarified in the first run, another 16-bit key is created.

**Encryption:** This module is developed so that the keys built in the dynamic key generation algorithm are not broadcasted specifically to create the uid vulnerable against assaults. The strategy encodes 32-bit sender uid with the support of the two 16-bit keys produced by the key generation algorithm. Initially, the 32-bit uid of the sender A is separated into two equivalent parts resulting in two 16-bit numbers. After that two bitwise XOR tasks are performed: one is among most significant 16-bit split of uid and 16-bit key received from first running of key generation algorithm and the other is between the least significant 16-bit split of uid and 16-bit key got from second running of the key generation algorithm. Because of this again two 16-bit numbers are produced. At long last, one more XOR task is performed between these two 16-bit numbers resulting in encoded sender uid.

**Embedding the Key Intimation:** Consider the 4-bit arbitrary number produced by the key generation algorithm as the key intimation. Presently this key indication requires to be embedded in the 16-bit encrypted sender uid. It creates utilization of the area (cartesian co-ordinates) of the sender and receiver for identifying the places of embedding. The technique of embedding is as following. Initially, the aggregate of the co-ordinates of A (XA, YA) and the receiver B (XB, YB) is calculated.

After that a count begins from the LSB position of the 16-bit encoded uid of A and it goes ahead till the count achieves the position of the estimated sum. Presently, MSB of the 4-bit key indication number is embedded in the bit position at the position of the encoded uid where the initial count closes. The count begins again from the following position and proceeds till the aggregate is achieved again. Presently, the second bit from MSB of the intimation is positioned at the place of the uid where the second count ends. In this way the procedure proceeds until all the 4 bits of the random number are embedded in the 16-bit encoded uid. But, in case the count exceeds the sixteenth position, after that the count resumes from the LSB position. In this way, at last a 20-bit number is created which is broadcasted to B.

**Receiver Side Algorithm:** As specified in Assumptions, the receiver knows the areas of the sender A and its own. Presently with the support of this data and following a similar methodology of embedding (area A.3) at sender side, the receiver is capable to extract the key intimation. After accepting the 20-bit number from the sender, B extracts the 4-bit key indication from the proper positions. B then runs a similar strategy of encryption (area A.2) on the uid of A which previously exists in its neighbor list, to calculate the 16-bit encrypted uid. If the outcome is coordinated with the 16-bit encoded uid created from the received 20-bit number, after that it verifies node A. Thus this algorithm provides security to data heavily in WSN.

**RESULT AND DISCUSSION**

The performance of the projected method is examined by the Network simulator. The simulation of the projected method has 30 nodes disposal in the simulation region 400×400. The nodes are communicated with others by the help of communication protocol User Datagram Protocol.

**Throughput:** Throughput is the important parameter in determining the presentation of the network. The average of victorious messages sends to the base station. If there is improved throughput, system can perform in an efficient manner. The efficiency thus plays a significant part in the communication networks.

![Figure 1: Throughput of NAKD and EACA](image)

Figure 1 indicates that the projected method EACA has better throughput when compared to the presented method NAKD.
Residual Energy: The quantity of remaining energy in a node at the present case of time is called as residual energy. In the network operations the rate of consumed energy is calculated by the residual energy.

Figure 2: Residual Energy of NAKD and EACA

Figure 2 indicates that in the network the residual energy is enhanced for the projected method EACA when compared with the presented method NAKD. In EACA, reduce the node will be dead also As long as there is residual energy, the network would have an enhanced network lifetime in the network.

CONCLUSION

WSN are extensively used in environment fields, military fields, and they connected to the Internet by using the IP protocol, this leads to form the Internet of Things (IoT). Real exploitation of WSNs desires maintenance in mind of serious security consideration. In wireless sensor systems, sensor nodes for the most part switch among dynamic mode and sleep mode to diminish energy utilization. The basic practice for saving energy is the utilization of sleep mode where huge parts of the sensor’s modules are turned off. The cryptography algorithm is used to sender side and receiver side thus this scheme improve the network performance.

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REFERENCE


Mixed Radix 4 & 8 Based SDF-SDC FFT Using MBSLS for Efficient Area Reduction

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ABSTRACT

Fast Fourier Transform (FFT) accomplishes an important role in communication system. Mixed radix 4 & 8 based SDF-SDC FFT using MBSLS for efficient area reduction has been proposed. MBSLS (Modified Borrow Select Subtractor) has been projected for reducing the area and power utilization. Number of additions and multiplication has been reduced by FFT algorithm which is computed in an ordinary complex plane. MBSLA reduce the hardware utilization of the system. Therefore, MBSLS incorporated into the processor which is very useful to design OFDM communication system. Optimization in area and power has been attained by mixed radix 4&8 SDF-SDC FFT structure. Speed of the system has been increased by SDF (structure and SDF structure used to achieve reduction in area and power consumption. Proposed architecture has been simulated by Modelsim simulation environment and performance analyzed by Xilinx 12.4.

Keywords: Mixed Radix-4 & Radix-8, SDF, SDC, MBSLS, Xilinx 12.4, Modelsim

INTRODUCTION

Frequency domain signal evaluated by Fourier transform and it is a source of various signal processing and communication applications. In the domain of physical science such as engineering, physics, chemistry and applied mathematics is the application of Fourier transform. Reduction in computation time and improvement in performance of structure mainly scarlet over the direct evaluation of DFT by the use of FFT, in physical layer the FFT algorithm is one of the methods which provide elevated computational difficulty. Therefore, FFT design is offered for executing the FFT computation capably.

The FFT algorithms are categorized into two universal categorisations, namely, the DIT and DIF algorithms. In DIF, the input samples are fed to the computing architecture in their normal order, though the output is produced in bit-reversed order and DIF. On the other hand, in DIT algorithm, the input samples require bit-reversal reallocation before being progression, though the output FFT coefficients are produced in normal order. In this paper, an enhanced version of Radix-4 and Radix-8 FFT algorithm has been proposed which is much proficient. The major goal is to plan a high performance of radix-4 and 8 FFT structure which has elevated throughput, fewer area and also shrunk the hardware resources.

RELATED WORKS

Chen et al., explained Hardware efficient mixed radix-25/16/9 FFT for LTE systems. 25-, 16-, 9-, 8-, 5-, 4-, 3-, and 2-point FFTs are supported by the 2-D factorization scheme executed by enhanced delay element matrix design. Two different architectures were executed. One architecture carries 34 different transform sizes from 12 to 1296 points, though the other design supports five altered power-of-two sizes from 128 to 2048 points. Co prime accessing technology is used to perform 1-D factorization process which accesses the data in parallel without difference using a RAM. The GHR combines 2-D and1-D factorization methods and develops the throughput by a factor of two to four with similar hardware cost evaluated with the prior architectures. The speed–area ratio of the projected method is practically two times enhanced than that of earlier FFT processors.
Bouguezel et al., [2] developed to shrinks significantly the operations such as address creation; data transfer and twiddle factor estimation or access to the lookup table, which give considerably to the execution time of FFT algorithms. Mixed radix-2 and 4 index plans used to project the important scheme. The algorithm is communicated in an easy matrix form and allocating for an accumulation to the multidimensional case. For the organizational complexity, the significant properties of the Cooley–Tukey approach such as the use of the butterfly design and in-place calculation are conserved by the projected algorithm.

Suruthi and Arulkumar [3] developed to perform Hardware description language VHDL which is used to show the simulation of functionality of designed architecture. Additional structures explicitly R22SDF, R4SDC through folding method with shrunked hardware difficulty is projected. Evaluation is completed between the prior and projected design.

Ramakrishna et al., [4] proposed Memory efficient FFT processor with low power utilization is designed by the proposed method. Improved memory addressing system is projected to deal with these complex and elevated radix FFT processors. Dual port merged bank memory is calculated in-order to deal with memory based FFT processors. One memory required to store those computational permutations in each every butterfly unit. Therefore, if radix of FFT enhances, memory necessity enhances. Implies, additional density tenancy, additional power utilization is yielded. Memory based FFT processor problems have been deal by area efficient algorithm with single port, merged-bank memory Algorithm with Low Power using cached memory. A proficient and improved algorithm like Radix-16 modified booth and carry skip adders are used in this method.

Jia et al., [5] explained efficient implementation of radix-8 FFT algorithm. Less multiplications and shrunked memory accesses is the benefit of High radix Cooley-Turkey FFT algorithms hence power consumption can be decreases. But, the drawbacks are that usual direct mapping enhancement of high-radix butterfly element will necessary to additional complex multipliers and hence large silicon area will be utilized. This approach employed pipelining schemes to cascade the paralleled multipliers and thus smaller quantity of complex multipliers has been utilized to recognize the radix-r butterfly element. This approach can attain a high-quality trade-off between speed and area in the architecture of elevated radix butterfly element.

Jayaram and Arun [6] proposed Survey Report for Radix 2, Radix 4, and Radix 8 FFT Algorithms. In electronics and communication field FFT perform a vital role. The different types of FFT radix algorithm have examined and are to be customized in prospect. This structure extensive computational requirements, it occupies high area and utilizes elevated power if executed in hardware. Proficient algorithms are proposed to enhance its design. Power utilization, hardware, memory obligation and throughout of every algorithm have distinguished in this system.

Mainkadan and Anand [7] proposed Design of 128 point FFT using mixed radix with combined SDF-SDC structure for OFDM Application. Fast computation achieved by the mixed radix-2, 4 FFT structure and combined SDF-SDC design have different advantages that are improved speed of the processor and reduced area, power utilization. Hence, the SDF-SDC combinely incorporated in OFDM communication scheme. Modelsim simulation environment is used to simulate the proposed structure and performances also analyzed by Xilinx plan-ahead 12.4 tool.

**Radix-4:** Reduction in computational path has been improves the speed of functioning in radix-4 FFT and it is illustrated in figure. If power decreases, the base will increase. Radix-4 FFT the number of steps is shrunk to 50%. It takes four inputs and outputs and it follow in-place algorithm. The shorter FFT outputs are reclaimed to estimate various outputs; therefore the total computational price is significantly decreased. The radix-4 FFTs needs only 75% as some complex multiplications as the radix-2 FFTs and Figure 1 shows Radix-4 FFT.

\[
Y_k = \sum_{n=0}^{N-1} y_n W_N^{nk}, 0 \leq k \leq N - 1
\]

\[
Y[K] = \sum_{n=0}^{N-1} y(n)W_N^{nk} + \sum_{n=0}^{N/4} y(n)W_N^{nk}
\]

\[
+ \sum_{n=0}^{N/2} y(n)W_N^{nk} + \sum_{n=4}^{3N/4} y(n)W_N^{nk}
\]

\[
Y[K] = \sum_{n=0}^{N/4} \left( y(n) + W_N^{nk/4} (y(n + N/4)) \right) + \sum_{n=0}^{3N/4} \left( y(n + 3N/4) \right) W_N^{nk}
\]
Radix-8 algorithm: Radix-8 FFT algorithm was detected to extend the speed of implementation by sinking the computation; it can be achieved by varying the base to 8. For a correspondent number if base enhances the power will shrink in Lihong J et al., 1999. FFT algorithms using superior radix can be intended by decomposition of the frequency domain samples into additional collections at the cost of additional complex control. Signal-flow graph is used to recognize the high-radix butterfly elements. However, the routing price for high-radix butterfly element becomes unnecessary. Therefore, it is commonly executed by cascading lesser radix butterfly elements. Radix-8 butterfly element is used as the major building block and radix-8 FFT is shown in Figure 2.

The N-point DFT is defined by

\[ X(k) = x(n)W_N^{nk}, K = 0,1,\ldots, N - 1, W_N^{nk} = e^{-j\frac{2\pi}{N}nk} \]

Proposed mixed radix-4 & 8 SDF-SDC FFT: Mixed Radix FFT structure has more advantage than normal Radix FFT. In proposed architecture contain mixed radix-4 & 8 with combined SDF-SDC FFT structure. Single Delay Feedback (SDF) structure provide elevated speed, likewise the advantages of Single Delay Commutator (SDC) structure are less LUTs, slices dissipation and low power consumption. SDF is used to shuffles the complex input data to a novel series that has real element which followed by imaginary element. Figure 3 illustrates the block diagram of 16 point mixed radix (radix-4, 8) FFT algorithm.

The SDC step shuffles support the novel series to the complex plan and it has processing elements (PE). Both the techniques have advantage and difficulty, thus combine the SDF-SDC design and propose the novel design. Figure 4
show that the proposed architecture of Mixed Radix-4 and 8 based SDF-SDC FFT. To implement pipelined radix-4 and 8 FFT using SDF-SDC design, it needs 1 SDF stages and 2 SDC steps facilitate reduction in area, power and delay. The Figure 5 shows the block diagram of modified borrow select subtractor. Architecture of mixed radix-4 & 8 by using modified borrow select subtractor (MBSLS) has been proposed in figure which is combinely used to reduce the delay, power consumption of the circuit and area also reduced, so speed has been increased and figure 6 shows the gate count evaluation of XOR gate. In digital integrated circuit design, adders are efficiently used. The operation of common subtraction is completed in the processing element. Now, the modified borrow select subtractor is used to perform the subtraction operation. This subtractor design is proficient in this structure and Figure 7 shows the design of reduced full subtractor and gate count value of XOR gate has been shown in Figure 6.

Gate Count of Full Subtractor is determined as follows,

\[
\text{Full Subtractor Gate Count} = (2 \times \text{XOR}) + (2 \times \text{AND}) + (1 \times \text{OR}) + (2 \times \text{NOT})
\]

Full Subtractor Gate Count = (2*5) + (2*1) + (1*1) + (2*1) = 10+2+1+2 = 15

Reduced Full Subtractor Gate Count = (2 \times \text{AND}) + (1 \times \text{OR}) + (3 \times \text{NOT}) + (1 \times \text{MUX})

Reduced Full Subtractor Gate Count = (2*1) + (1*1) + (2*1) + (1*4) =2+1+3+4=10

RESULT AND DISCUSSION

Design of mixed Radix-4 & 8 based SDF-SDC FFT using Modified Borrow Select Subtractor (MBSLS) has been proposed by using Verilog HDL. The simulation results have been approximated by using ModelSim 6.3c, and Synthesis Performance are estimated by using Xilinx 12.4 tool. The simulation result of mixed radix-4, 8 using carry select adder and borrow select subtractor has been shown in Figure 8.
Table 1: Comparison analysis of mixed R2SDF-R4MDC FFT and mixed radix-4 and 8 based SDF- SDC FFT using MBSLS

<table>
<thead>
<tr>
<th>Types of FFT Implementation</th>
<th>Slices</th>
<th>LUTs</th>
<th>Delay (ns)</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 point Mixed R2SDF-R4MDC FFT</td>
<td>2679</td>
<td>4741</td>
<td>23.677</td>
<td>0.864</td>
</tr>
<tr>
<td>16 point Mixed Radix-4 and 8 based SDF-SDC FFT using MBSLS</td>
<td>1357</td>
<td>2480</td>
<td>23.204</td>
<td>0.772</td>
</tr>
</tbody>
</table>

From the above Table 1, it is clear that the number of slices is 2679 and 1357, the number of LUTs is 4741 and 2480, the delay is 26.244 and 21.691 and the power is 0.864 and 0.772 in the existing and proposed technique. When compared to existing technique, the proposed technique gives better performances.

**CONCLUSION**

In this paper, the proposed 16-point Mixed Radix-4 and 8 based SDF-SDC FFT using Borrow Select Subtractor has been designed through VLSI System design environment for OFDM application. So, the proposed design helps to attain reduction in area, delay and power utilization of the processor. The proposed Mixed Radix-4 and 8 based SDF-SDC FFT using MBSLS design offers 49.34% reduction in slices, 47.69% alleviation in LUTs, 2.03% reduction in delay and 10.64% shrinking in power utilization.

**Ethical Clearance:** Taken from St. Peter’s University, St. Peter’s Institute of Higher Education and Research

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**Conflict of Interest:** Nil

**REFERENCE**


K-Means Cluster Based Leaf Disease Identification in Cotton Plants

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ABSTRACT

Pests are found to be most common and continuous threat for the agricultural crops in India which would affect the entire plant including leaves and roots. The quality of plant products can be improvised by introducing the early diagnosis techniques for plant diseases. Last year analysis of cotton crops found that the bulk of crops are lost due to increased infestations created by pests and insects. In this proposed method, detection of pests and types of disease occurred in cotton plants by introducing the SVM classifier. Initially image capturing devices are integrated in the crop yields to gather the plant images periodically. These time serious images are preprocessed first using median filter which is then segmented to attain the required image part using k means clustering method. After segmentation feature extraction is done where the following features are extracted: Color features (mean, skewness), texture features (energy, entropy, correlation, contrast, and edges). This texture feature extraction is done by using Gray Scale Co-occurrence Matrix (GSCM) which is then matched with the cotton leaf image without disease. The experimental evaluations are carried out using MATLAB software.

Keywords: K-means clustering method, Gray scale co-occurrence matrix, SVM classifier

INTRODUCTION

The most important food source of every human being in earth is obtained from the agriculture. The agriculture found to be plays important role in the economic growth of the country apart from providing the required food sources and consumption satisfied for the human existence. This agriculture growth is affected by the increased plant diseases which would cause and degraded both quality and quantity of food products [1].

In present days, various issues are faces by farmers due to dramatic changes in the climate and increased growth of insects. This results with the abnormal growth of plants. It is required to control the growth of pest insects to get the good quality and quantity outcome from the plants. Across world, various concerns are taken towards crop safety and ensuring the good growth of plants by spending millions of dollars. This is more important to ensure the safety level of crops from bio threats such as pests and insects to avoid the massive damage and crop loss. The survey agriculture proves that in India 19 of crop yield is lost approximately every year due to increased bio threat attacks which leads to Rs. 90,000 million loss.

There are more manual pest monitoring techniques are available such as sticky traps and black light traps. These traditional methods are utilized in many farms to control and reduce the pest and insects growth on agricultural plants. However these techniques are found to be time consuming and require more human effort.

The most common agent plant diseases are caused by pathogens. The leaves or stems of plants are most affected part on plants in which pests or disease can be found normally. Thus the accurate and efficient identification of number of plants, leaves and steps, percentage of disease caused by pests, and the symptoms of those diseases plays the more important role in the successful growth of plants. Generally two factors are found to be more serious threats for plants which might cause damage or death: those are living (biotic) and nonliving (abiotic) agents. The examples of biotic are insects, bacteria, fungi and viruses. The examples of abiotic are extremes of temperature, excess moisture, poor light, insufficient nutrients, and poor soil pH and air pollutants [1].

In this research work plant disease prediction is done. Here the segmentation process is carried out by applying K means clustering algorithm and feature extraction is done by using GLCM to extract the texture features. These features are classified by using the SVM classifier.
METHOD AND DISCUSSION

The main goal of proposed system is to detect the leaf disease present in the cotton plants. The processing flow of disease prediction is shown in the following figure 1.1.

![Flow chart of disease identification of lead in cotton plants](image)

The image sensors are placed in the agricultural field to gather the cotton plant leaf images. These images are collected in the format of files. After image collection, preprocessing is done to improve the quality of images by eliminating the noises and blurs. This resultant with the improved image, thus the enhanced image features can be extracted for further steps. Here median filter is utilized to perform preprocessing. The median filter eliminate the noises efficiently which leads to accurate prediction outcome.

(i) **Image Segmentation:** Segmentation of leaf images are done after preprocessing. Here the segmentation is performed by introducing the methods namely local threshold based segmentation and k means clustering technique. The integration of this techniques leads to efficient prediction of abnormal portions from the entire image. This segmentation ensures the increased prediction accuracy of lead disease in cotton plant. The overall processing flow of this research method is given here. Initially threshold based segmentation techniques is applied to extract the attributes of diseased leaf image. This technique separates the background and foreground regions accurately. The constraint of local thresholding is given as follows:

\[
\begin{align*}
\text{If } d[m,n] & \leq \theta \\
\text{Else } d[m,n] &= \text{object } = 1 \\
\end{align*}
\]

This constraint is used to extract the features from the image. This method provides the details about both object pixels and border pixels. This gradient techniques find the contours and border information among the group of pixels easily. This method result with the binary images by performing segmentation frequently on gray scale images. The morphological processing of the binary image permits the further improvement of the segmentation result.

The binary image features are represented by Skeleton method. Then only is very easy to identify the wanted regions from the unwanted regions. After morphological operations the images are converted from binary to gray scale image. The structuring element is gray scale image only.

(ii) **Clustering and classification:** K-Means clustering method is used to cluster the extracted features. These features are clustered based upon the similarity and dissimilarity nature. Among the all cluster features, the color features such as mean, skewness, texture features such as energy, entropy, correlation, contrast, edges are extracted from diseased leaf image using gray scale co-occurrence matrix (GLCM). It is a statistical method of examining texture that considers the spatial relationship of pixels as gray-level co-occurrence matrix (GLCM), also known as the gray-level spatial dependence matrix. The GLCM functions characterize the texture of an image by calculating how often pairs of pixel with specific values and in a specified spatial relationship occur in an image, creating a GLCM, and then extracting statistical measures from this matrix. Because the diseased leaf have variations in color and texture features only. The GLCM very helpful to extract these features and fine tuning the accuracy.

The SVM classifier is used to classify the features extracted from segmentation. The SVM’s are very good when no idea on the data. It Works well with even unstructured and semi structured data like text, Images and trees. It is represented by using Gray level co-occurrence matrix. This
single matrix representation is helpful to identify the correlation between pixels also. This method can be used to analyze in three different ways, namely Spectral, Structural and Statistical. With the help of statistics nature of the features, the Homogeneity, Energy, Correlation and Contrast are identified and calculated.

1. Experimental Results and Analysis: The leaf image is taken from the available dataset. This input leaf image is segmented and clustered using K-means clustering method. Based upon the clustering analysis the name of the disease in the leaf is identified. Here we have tested only two diseases predicted in the leaf of cotton plant. Namely blight disease and leaf miner. The blight disease caused by Alternaria macrospora Zimm oraganisam. This disease may occur in all stages but more severe when plants are 45-60 days old. Small, pale to brown, irregular or round spots, measuring 0.5 to 6 mm diameter, may appear on the leaves. Each spot has a central lesion surrounded by concentric rings. Several spots coalesce together to form blighted areas. The affected leaves become brittle and fall off. Sometimes stem lesions are also seen. In severe cases, the spots may appear on bracts and bolls.

![Cluster Output](image)

After clustering, the clustered output is compared with the given data set and identifies the name of the disease in the leaf. This method has to identify the leaf disease in cotton plant so early. If we take the remedy action quickly based upon this method then the level of cotton won’t be reduced.

![Selection of Cluster](image)

Table 1.1: Prediction of leaf disease in cotton plant

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Disease in cotton plant</th>
<th>Number of correct test samples</th>
<th>Number of incorrect test samples</th>
<th>Recognition of disease accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Blight disease</td>
<td>20</td>
<td>1</td>
<td>95.23</td>
</tr>
<tr>
<td>2.</td>
<td>Leaf miner</td>
<td>20</td>
<td>2</td>
<td>90.90</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>40</td>
<td>3</td>
<td>93.02</td>
</tr>
</tbody>
</table>

![Comparison of Disease Prediction Accuracy](image)
The proposed method was tested and identifies only two diseases. Those are: Blight disease and Leaf miner. These features are very important for the color and morphology of leaf spots and they provide critical information about its visual representation. By using segmentation technique it is easy for us to extract the features of disease leaf of the image.

**CONCLUSION**

The main goal of this method is to predict the healthy and unhealthy leaves from the cotton plants. The proposed method ensures the accurate prediction outcome. The training dataset of this research work consists of diseased images alone which is referred as composed data set. Initially leaf images were preprocessed which is then cropped to normal size. After preprocessing, features extraction is done by using k means algorithm where k mean key points are extracted for each leaf image to find the knowledge about unique feature. This allows finding the similar features from different images. Applying the neural network for the feature classification might result with more accurate outcome.

**REFERENCES**


Analysis of Clustering Approaches for Skin Lesion Segmentation Using Dermoscopic Images

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ABSTRACT

In this paper, clustering approaches are analyzed for skin lesion segmentation using dermoscopic images. Three widely used machine learning approaches for image segmentation are K-Means Clustering (KMC), Fuzzy C-Means Clustering (FCMC), and Expectation-Maximization (EM) algorithm. The difference between KMC and FCMC lies in the partitioning method. The former one uses hard partitioning, and the later uses a variable degree of membership. In the EM algorithm, statistical methods are employed for distance calculation whereas, in KMC, the Euclidean distance measure is used. The segmentation results of individual clustering approaches are combined to get the refined skin lesion. Results show that the combined segmentation provides promising results for skin lesion segmentation in comparison with KMC, FCMC and EM algorithm.

Keywords: Skin lesion segmentation, clustering techniques, k-means clustering, fuzzy clustering, expectation-maximization algorithm

INTRODUCTION

Skin lesion segmentation is a very important step for automated analysis of skin cancer using dermoscopic images. The modified watershed technique is discussed in [1] for dermoscopic image segmentation. To reduce the border detection errors, a neural network classifier is utilized, and edge object value threshold method is used to remove large light blobs near the lesion boundary, and a noise removal procedure is applied to reduce the peninsula-shaped false-positive areas.

Wavelet Network (WN) based segmentation of skin lesions is described in [2]. WN is a member of fixed-grid WNs which does not require any training. The raw pixels in three colour channels are considered as the network inputs. Comparison of segmentation methods such as active contour-snacks algorithm, adaptive thresholding, and active contour-level set are discussed in [3]. Genetic algorithm based segmentation of skin lesions is discussed in [4] using an optimized approach. It overcomes the main drawback of other approaches such as over segmentation. A review of various skin lesion segmentation approaches such as edge based, region based and threshold based is described in [5].

Texture feature based skin lesion segmentation is discussed in [6]. At first, the textures of skin and lesion regions are characterized, and then texture distinctiveness metric is used for the segmentation. Optimal colour channel based skin lesion segmentation is discussed in [7]. Initially, the given dermoscopic images are resized uniformly and then de-noised. Then the regions with similar features are merged together by morphological operations to trace the boundary of the skin lesion. An evolutionary strategy is used for lesion segmentation in dermoscopic images [8]. It is a random search technique which is applied to the pre-processed image. Histogram thresholding is applied for skin lesion segmentation in [9]. After thresholding connected component analysis is employed for segmentation. Different colour channels such as HSV, HSI, CIE-LAB, and CIE-XYZ are analyzed.

Otsu’s threshold based skin lesion segmentation is described in [10]. At first, the given colour image is converted into a gray scale image, and then a Gaussian filter is applied which is a two-dimensional low pass filter. The role of shape in dermoscopic image segmentation is discussed in [11]. Adaptive thresholding is applied for segmentation. Delaunay triangulation for skin lesion segmentation is discussed in [12]. It consists of four stages to segment the skin lesions; artifact removal, detection of skin, segmentation and finally merging.
Histogram based skin lesion segmentation is described in [13]. At first, a median filter is applied to smooth the image and then contrast enhancement is done by using the edges from Prewitt operators. Then histogram thresholding is applied to get the skin lesion. Image fusion for skin lesion segmentation is described in [14] using the segmented images from a uniform distribution and active contour method.

In this paper, three different clustering approaches; KMC, FCMC, and EM are analyzed for skin lesion segmentation using dermoscopic images. Section 2 gives the materials and methods for the above-mentioned clustering approaches. The clustering results are discussed in section 3. At last, the conclusion is presented.

**MATERIALS AND METHOD**

In this section, three different machine learning approaches; KMC, FCMC, and EM algorithm are discussed for skin lesion segmentation.

KMC is one of the methods of clustering the data points into a specific number of disjoint clusters. The number of clusters specified is referred to as “k”. The determination procedure uses distance measures to determine which observation or data points belong to which cluster. KMC aims to achieve the lowest distance measure. To minimize the distance between the centroid of the clusters, the data points are assigned to clusters iteratively, and the process is terminated when the lowest distance measure is achieved. KMC algorithm is as follows:

1. Initially, the sample space is partitioned into \( k \) clusters, and the observations are randomly assigned to the clusters.
2. For each sample
   - The distance is calculated from the observation to the centroid of the cluster.
   - IF the sample is closest to its cluster THEN leave it ELSE selects another cluster.
3. Steps 1 and 2 are repeated until the observations are moved from one cluster to another.
4. When the step 3 terminates, each sample is assigned a cluster which achieved a lowest possible distance to the centroid of the cluster.

FCMC is widely used in segmenting images for various applications which clusters similar samples in the data. Due to the fuzzy membership function, it retains more information than other clustering approaches. FCMC partitions the given image pixels into ‘C’ fuzzy clusters based on some criteria [15]. It is based on the minimization of the objective function in eqn. 1

\[
J_m = \sum_{i=1}^{N} \sum_{j=1}^{C} u_{ij}^m \| x_i - c_j \|^2 \quad 1 \leq m < \infty \quad \ldots(1)
\]

\[
u_{ij} = \frac{1}{\sum_{k=1}^{C} \left( \| x_i - c_k \|^2 \right)^{\frac{m-1}{2}} } \quad \ldots(2)
\]

\[
c_j = \frac{\sum_{i=1}^{N} u_{ij}^m x_i}{\sum_{i=1}^{N} u_{ij}^m} \quad \ldots(3)
\]

where \( N \) is the number of data points, \( C_j \) is the \( d \)-dimension center of the cluster and \( u_{ij}^m \) is the degree of membership of \( x_i \) in the cluster \( j \) and \( m \) is any real number greater than 1.

The EM algorithm is used to accomplish the fitting of each Gaussian mixture to the training data points of a given class. The goal is particular for the GMM to maximize the likelihood of the training data points with respect to the parameters that consist of the mean and covariance of each component, and also mixing coefficients. The EM algorithm has a simple implementation with the guaranteed monotone that increases the likelihood of the training set during optimization.

- Initialize the means \( \mu_k \), covariance \( \Sigma_k \) and mixing coefficients \( \pi_k \) and evaluate the initial values. The algorithm starts from some initial estimate of \( \Theta \) and then proceeds to update \( \Theta \) until convergence is detected iteratively. Iteration consists of E-step and M-step.

- **Expectation step (E-step):** Responsibilities are evaluated by using the current parameter values.

\[
\gamma(z_{nk}) = \frac{\pi_k N \left( x_n ; \mu_k , \Sigma_k \right) }{\sum_{j=1}^{k} \pi_j N \left( x_n ; \mu_j , \Sigma_j \right) } \quad \ldots(4)
\]

Where, \( x_n \) is the posterior probability \( (Z_{nk}) \) the component \( k^{th} \) was responsible for generating data point \( x_n \).

- **Maximization step (M-step):** The parameters are re-estimated by using the current responsibilities.
\[
\mu_k^{new} = \frac{1}{N_k}\sum_{n=1}^{N} z_{nk} x_n
\]  \hspace{1cm} \text{...}(5)

\[
\mu_k^{new} = \frac{1}{N_k}\sum_{n=1}^{N} z_{nk} (x_n - \mu_k^{new})(x_n - \mu_k^{new})^T
\]  \hspace{1cm} \text{...}(6)

\[
\mu_k^{new} = \frac{N_k}{N}
\]  \hspace{1cm} \text{...}(7)

Where, \( N_k = \sum_{n=1}^{N} z_{nk} \)

- Evaluate the likelihood

\[
\ln p(X|\mu, \Sigma, \pi) = \sum_{n=1}^{N} \sum_{k=1}^{K} \pi_k N(x_n | \mu_k, \Sigma_k) \]  \hspace{1cm} \text{...}(8)

- It checks the convergence of parameters or log likelihood, and if the condition is not satisfied, it returns to the step (4).

**FINDINGS**

The performances of three machine learning approaches for skin lesion segmentation are discussed in this section. As the clustering approaches are designed for gray scale images, the skin lesion images are initially transformed from its colour model to the gray scale image. Figure 1 shows some samples of skin images and their corresponding gray scale images. Figure 2 shows the clustered results of images shown in Figure 1.
It is observed from the Figure 2 that among the various clustering approaches, EM and FCMC algorithms provide comparable and superior segmentation results than KMC algorithm. The main drawback of all these clustering approaches is the selection of a cluster that contains the lesion and also the number of clusters to be used. After selecting the cluster that contains the lesion, a refinement step is used to refine the lesion. The refinement step is as follows: Let us consider, \( S_1, S_2, \) and \( S_3 \) are the segmented lesion images obtained from KMC, FCMC and EM algorithm. \( S_i = \{0, 1\} \), where 0 corresponds to the skin region and 1 corresponds to the lesion region. All \( S_i \) are combined to get the refined lesion by XOR operation which is defined by (9).

\[
S_r = (S_1 \oplus S_2) \oplus S_3 \quad \ldots(9)
\]

where \( S_r \) is the refined segmented image. Figure 3 shows the selected cluster for lesion segmentation. From the results, the segmentation accuracy is computed with respect to the ground truth lesion in the database. Table 1 shows the segmentation accuracy. It is observed that the segmentation accuracy of hybrid approach is higher than KMC, FCMC and EM as the number of false positives is reduced.

![Figure 3: Lesion output KMC (1st row), FCMC (2nd row), EM algorithm (3rd row) and Hybrid (last row)](image)

<table>
<thead>
<tr>
<th>#Image</th>
<th>Segmentation Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KMC</td>
</tr>
<tr>
<td>1</td>
<td>84.29</td>
</tr>
<tr>
<td>2</td>
<td>75.82</td>
</tr>
<tr>
<td>3</td>
<td>95.30</td>
</tr>
</tbody>
</table>

Table 1: Segmentation accuracy obtained by the clustering approaches
CONCLUSION

In this paper, three machine learning approaches; KMC, FCMC, and EM algorithm are applied on dermoscopic image segmentation, and their performances are evaluated. In FCM and EM, the data point can be in more than one cluster whereas in KMC it belongs to one cluster only. The segmentation by the above-mentioned approaches for dermoscopic images is obtained. They provide promising segmentation results and also the hybrid of these clustering approaches provides high segmentation accuracy than their individual counterpart. However, the drawbacks of the above three techniques are the requirement of the number of clusters as an input and also a selection method to select the cluster which contains the skin lesion.

Ethical Clearance: Taken from CEG Campus, Anna University

Source of Funding: Self

Conflict of Interest: Nil

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SVM based Lung Cancer Classification Using Texture and Fractal Features from PET/CT Images

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ABSTRACT

Early lung cancer detection is extremely challenging as symptoms are not exposed till advanced stage. This study is aimed at developing a computer aided diagnosis (CAD) system with image processing techniques and support vector machine (SVM) in lung cancer classification from positron emission tomography/computed tomography (PET/CT) images. The developed CAD system utilized fuzzy enhancement for contrast improvement. Texture and fractal features were used for training the SVM. This study utilized 82 PET/CT images and 10-fold cross validation to analyze the performance of the classifiers. Experimental study showed that SVM classifier with radial basis function (RBF) kernel of width, $\sigma = 1$ outperformed the other SVM models. It produced maximum accuracy of 98.13% using texture and fractal features from PET/CT images. The RBF kernel is effective in handling sparse, non-linear, multi-dimensional data to transform it into linearly separable.

Keywords: Lung cancer; PET/CT; feature extraction; computer aided diagnosis; support vector machine.

INTRODUCTION

Lung cancer is the leading cause of deaths due to cancer, marked aggressive and low survival rates. Every year about 1.8 million individuals are diagnosed with lung cancer worldwide. Improved 5-year survival rate up to 58 – 73% could be achieved, if it is detected in the initial period. But detecting the lung cancer at the initial stage is very much challenging due to the awful characteristics of this disease. Lung lesions are broadly varying in dimensions and show a huge disparity in intensity. Lesions can present anywhere in lung, concealed by ribs or attached to chest wall; thus, instigating massive variation of contrast to the background. PET/CT is a supreme imaging technique in lung cancer diagnosis, staging and treatment planning as it provides complementary morphological and anatomical information [1][2]. Major drawback in PET/CT is the false positives (FPs) due to inflammations or infection caused by other lung diseases [3]. Also, in PET/CT, the CT scans performed at minimal energy settings to reduce the radiation effects result in poor image quality; hence affecting the diagnostic accuracy [4].

Huge volume of images acquired by number of medical imaging modalities and number of images per study loads the medical experts in construal which may result in error prone diagnosis. Therefore, CAD systems are highly essential to assist radiologists in lung cancer diagnosis with increased speed, accuracy, minimum diagnostic errors and less time [3].

CAD plays a major complementary role in medical diagnosis [6] CAD systems developed using image processing techniques and artificial intelligence (AI) for lung image interpretations using various image modalities have been critically reviewed [7] Several researchers made significant contributions in developing a CAD system for lung cancer detection on X-rays and CT scans using texture analysis of PET/CT images [8].

Texture analysis (TA) plays a key role in discriminating between normal and abnormal medical images. Texture features are found beneficial in image
Few researchers have analyzed the first and second order statistical texture features to detect the lung cancer from X-ray, CT and PET/CT images \[10\]-\[12\]. However, texture features might be insufficient to identify and classify smaller lymph nodes.

Medical images are characterized by irregular complex tissue structures which cannot be quantified by traditional Euclidean geometry. Hence, Fractal geometry has been used widely to analyze medical images and found significant to find the aggressiveness of the lung cancer \[13\].

Classification algorithms play an important role in CAD systems in detecting the malicious regions from medical images. Even though, existing CAD systems to detect lung cancer are reliable, these CAD systems can be improved in future for high level of automation and reduced number of FPs \[14\]. SVM is the most popular machine learning (ML) technique used in lung cancer classification.

Significant texture features yielded a comparable accuracy of 93.2 % by SVM to artificial neural network \[15\]. Recent studies have demonstrated that SVM has been found as a popular ML tool in classification of medical images. A new computerized system for lung cancer classification was developed by several researchers using SVM classifier to improve the diagnostic accuracy and tested on texture features of PET/CT images \[16\]-\[18\]. Based on these deliberations, SVM based lung cancer classification was developed using texture and fractal features from lung PET/CT images to achieve augmented diagnostic accuracy.

**MATERIALS AND METHOD**

This method involved a retrospective study of 18F-fluorodeoxyglucose (FDG) PET/CT images from 82 patients. Patients underwent PET/CT scan after administering an intravenous injection. CT and PET images were acquired sequentially and then fused. PET/CT provides complementary anatomical and functional information and provides improved localization. PET/CT images of dimension 256 × 256 were considered for this study. Images were collected from Anderson Diagnostics & Labs, Chennai. Statistics of the data collected for this study is listed in Table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients count (male/female/total)</td>
<td>50/32/82</td>
</tr>
<tr>
<td>Patient age (min/max/median)</td>
<td>27/71/53</td>
</tr>
<tr>
<td>Benign/Malignant images count</td>
<td>34/48</td>
</tr>
<tr>
<td>Malignant (Stage II/III/IV)</td>
<td>12/21/15</td>
</tr>
</tbody>
</table>

Few normal lung PET/CT images and lung cancer PET/CT images in various stages are shown in Fig 1 and 2 respectively.

**Table 1: Patient Data**

Medical images suffer from noise and poor contrast. PET/CT images are affected by artifacts which are caused by metallic implants, respiratory motion and application of contrast. Quality of the medical images is affected by these artifacts which in turn affects the accuracy of medical image diagnosis. Hence image processing techniques are applied on the medical images to remove the noise present and to improve the image quality.

Traditional filters such as median, Gaussian and Wiener filtering techniques are used in de-noising the medical images. Wiener filter performs well for removing the presence of additive Gaussian noise in PET/CT images \[19\].

Contrast defines the difference in the intensity between the adjacent regions in an image and it is an important image feature to detect any abnormalities. Hence, it is highly essential to go for noise removal and enhance the contrast of medical images, before further processing for diagnosis or analysis. The main goal of image enhancement is to increase the image quality to have improved interpretation from the enhanced features.

Traditional contrast enhancement techniques such as histogram equalization and contrast limited adaptive histogram equalization (CLAHE) tend to result in over enhancement and loss of important local information.
which may lead to poor diagnosis. To overcome these drawbacks, fuzzy image enhancement has been utilized for contrast enhancement of PET/CT images. Fuzzy enhancement achieves improved enhancement by making the high intensity regions more brighter and low intensity regions darkened [20].

Traditional intensity based thresholding techniques may not contribute much in accurate segmentation and lung cancer detection. Texture analysis (TA) plays a vital role in medical diagnosis as various regions in medical images have unique texture information. TA methods are found useful in studying and discriminating distinct as well as subtle textures in multi-modality medical images like PET/CT images. An analysis of statistical texture features using gray level co-occurrence matrix (GLCM) from PET/CT images demonstrated that auto correlation, sum average and sum variance are the three significant texture features which are beneficial in lung cancer detection [21]. Table 2 lists the significant Haralick texture features and their expressions.

Table 2: Significant Haralick texture features

<table>
<thead>
<tr>
<th>Texture feature</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocorrelation</td>
<td>$t_{AC} = \sum_{i=1}^{Ng} \sum_{j=1}^{Ng} (i)(i, j)$</td>
</tr>
<tr>
<td>Sum average</td>
<td>$t_{SA} = \sum_{i=2}^{2Ng} ip_{xy}(i)$</td>
</tr>
<tr>
<td>Sum variance</td>
<td>$t_{SV} = \sum_{i=2}^{2Ng} (i - \mu_{xy})^2 ip_{xy}(i)$</td>
</tr>
</tbody>
</table>

Notations:
- $p(i, j)$ is $(i, j)^{th}$ entry in normalized GLCM = $\frac{P(i, j)}{R}$
- $Ng$ is number of distinct gray levels in quantized image
- $P_{xy}(i) = \sum_{i=1}^{Ng} \sum_{j=1}^{Ng} p(i, j)$ ; $i + j = k$ ; $k = 2, 3, ..., 2Ng$

Fractal geometry has been found as a useful area of mathematics in quantifying complex, irregular biological structures, which cannot be described by the Euclidean geometry [22]. Fractal approach characterizes a textured region by a non-integer dimension, known as fractal dimension (FD) and finds useful in many applications than statistical approaches. In medical image analysis to discriminate between normal and cancer regions, local FD is more preferred than global FD. Fractal analysis on PET/CT images yielded 10 significant fractal features computed from fuzzy enhanced and modified images over fuzzy enhanced images.

Huge amount of data has been obtained due to the remarkable advancements in image acquisition devices and volume of images per single study. This may liable to human error and may have inter-observer variations in interpretations. ML techniques have made a remarkable progress in recent times and played a vital role in medical image analysis and assist medical experts for speedy, automatic diagnosis and improved accuracy. Supervised learning algorithm develops a model based on training and makes predictions for new test data which are not in training set. These algorithms require a set of parameters tuned to optimal values that enable the model for best fitting of data and to perform in a best possible way.

SVM invented by V.N. Vapnik in 1998 now has become a popular tool in lung cancer diagnosis. SVM is a supervised ML algorithm for classification in which the dataset teaches SVM about the classes. Learned SVM tends to classify the new data into various classes by finding a hyperplane to separate various classes. Kernels are used in non-linear SVM to map the features into high dimensional space so that the linearly non-separable data are linearly separable. SVM with RBF kernels is the most preferred classifier for complex, non-linear data as the training problem is convex. SVM hyper parameter and model parameters must be tuned in achieving better classification accuracy. Fig 3 illustrates the SVM.

Considering the problem of classifying lung cancer images, with the extracted features and their classes, a trained SVM model must predict whether the given image is a normal one or having lung cancer. To find the hyperplane in separating various classes, weight vector ‘w’ and a bias ‘b’ are used. Function of the hyperplane can be expressed as:

\[ \text{Fig. 3: Demonstration of Support vector machine} \]
\[ W^T X + b = 0 \]  

…(2.1)

The data points are termed as normal or cancerous based upon the value of the hyperplane function and described as:

Normal if \( W^T X + b < 0 \)

Cancerous if \( W^T X + b > 0 \)  

…(2.2)

Maximum margin classification rule is followed in choosing the hyperplane. The distance between the closest dot points for each class to the hyperplane is considered as margin. The closest data points are known as the support vectors. SVM yields greater efficiency and no over-fitting of the data in high dimensional space.

Sensitivity, Specificity and Accuracy are the performance measures to evaluate the performance of the classifier, and given as:

Sensitivity = \( \frac{TP}{TP + FN} \)  

…(2.3)

Specificity = \( \frac{TN}{FP + TN} \)  

…(2.4)

Accuracy = \( \frac{TP + TN}{\text{Total number of sample}} \)  

…(2.5)

where TP = True Positive, FN = False Negative, FP = False Positive and TN = True Negative.

**FINDINGS**

This study analyzed lung PET/CT images retrospectively to detect and classify the lung cancer using texture, fractal feature descriptors and SVM. MATLAB R2013a was used to implement this method and tested on lung PET/CT images of size 256 × 256.

Extracted significant texture and fractal features were combined and a total of 13 features were used in classification. 1072 observations for these 13 combined features were taken from various regions of normal and abnormal images. These observations were arranged as a matrix and fed as input to the supervised classifier. SVM with various kernels such as polynomial and RBF with variable kernel width were tried and their performance was analyzed for finding the best classifier in classifying the lung cancer from PET/CT images. Performance measures such as sensitivity, specificity and accuracy obtained for various SVM models were listed in Table 3.

<table>
<thead>
<tr>
<th>Classifier Code</th>
<th>Classifier Name</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Linear SVM</td>
<td>81.65</td>
<td>87.08</td>
<td>83.80</td>
</tr>
<tr>
<td>B</td>
<td>Quadratic SVM</td>
<td>96.40</td>
<td>76.23</td>
<td>87.30</td>
</tr>
<tr>
<td>C</td>
<td>SVM (Polynomial, order 1)</td>
<td>95.74</td>
<td>84.70</td>
<td>90.76</td>
</tr>
<tr>
<td>D</td>
<td>SVM (Polynomial, order 2)</td>
<td>100</td>
<td>0</td>
<td>67.29</td>
</tr>
<tr>
<td>E</td>
<td>SVM (Polynomial, order 3)</td>
<td>100</td>
<td>34.28</td>
<td>78.50</td>
</tr>
<tr>
<td>F</td>
<td>SVM (RBF kernel, ( \sigma = 0.1 ))</td>
<td>95.57</td>
<td>80.00</td>
<td>88.52</td>
</tr>
<tr>
<td>G</td>
<td>SVM (RBF kernel, ( \sigma = 0.5 ))</td>
<td>97.44</td>
<td>90.08</td>
<td>94.12</td>
</tr>
<tr>
<td>H</td>
<td>SVM (RBF kernel, ( \sigma = 1.0 ))</td>
<td>98.61</td>
<td>97.14</td>
<td>98.13</td>
</tr>
</tbody>
</table>

It is evinced from Table 3 that all SVM models produced comparable sensitivity except linear SVM. However, most models have not produced better specificity; failed to reduce the number of FPs, which reduced the classification accuracy. SVM with polynomial kernel of order 2 and 3 produced very low specificities of 0 and 34.28% respectively.

SVM with RBF kernel of \( \sigma = 1 \) yielded high sensitivity and specificity with minimum number of FPs and FNs. Lower kernel widths such as 0.1 and 0.5 resulted in over fitting. Higher kernel widths greater than 1.0 caused under fitting, as the distance between data points and support vectors were smaller than \( \sigma \). RBF kernel of width \( \sigma = 1 \) lead to smooth, sharp decision boundaries and generalize strongly without much under and over fitting for the non-linear, complex data generated from PET/CT images.

![Fig. 4: Performance comparison of various classifiers](image-url)
Fig. 4 shows the plot of sensitivity, specificity and accuracy for various SVM models analyzed in this method. It is deduced from Table 3 and Fig 4, that SVM with RBF kernel, $\sigma = 1.0$ (Classifier H) outperformed all classifiers and yielded an accuracy of 98.13%. SVM is least sensitive to sample size as it uses only support vectors to build the separating hyperplane.

Existing CAD systems in classifying lung cancer from PET/CT images utilized texture features and classical supervised classifier, SVM. These methods utilized thresholding for lung segmentation and extracted the first and second order texture features. All these methods used 10-fold cross validation for evaluating the performance of classifiers.

The diagnostic accuracy of few CAD systems established for lung cancer classification from PET/CT images were compared with the results of this study utilizing texture and fractal features from PET/CT images. The observations are listed in Table 4.

Methods developed by (Gao et al., 2015) resulted in an accuracy of 86% and improved diagnostic accuracy was achieved in (Guo et al., 2015); whereas, the methods by (Zhao et al., 2015) produced sensitivity of 95.6%. Even though all these methods yielded a better accuracy, texture features might not be suitable for classifying small size lymph nodes.

### Table 4: Comparison of existing and developed CAD system in lung cancer classification using PET/CT images

<table>
<thead>
<tr>
<th>Contributors</th>
<th>Features</th>
<th>Classifier</th>
<th>Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gao et al [16]</td>
<td>Statistical texture features (angular second moment, contrast, correlation, sum variance and inverse difference moment)</td>
<td>SVM with RBF Kernel</td>
<td>86</td>
</tr>
<tr>
<td>Guo et al [17]</td>
<td>Multiple image features, SUV, heterogeneity, CT textures</td>
<td>SVM Augmented diagnostic accuracy</td>
<td></td>
</tr>
<tr>
<td>Zhao et al [18]</td>
<td>First order texture features, SUV</td>
<td>SVM with RBF</td>
<td>Sensitivity of 95.6</td>
</tr>
<tr>
<td><strong>Developed CAD system by this method</strong></td>
<td><strong>Second order texture features and fractal features</strong></td>
<td><strong>SVM with RBF</strong></td>
<td><strong>98.13</strong></td>
</tr>
</tbody>
</table>

Fuzzy enhancement designed for current study well enhanced the high textures with clear edges and facilitated to increase the diagnostic accuracy. Fractal features aided superior detection of cancerous regions and SVM is robust with strong generalization ability for moderate data using combined texture and fractal features for current study. It is evident from the experimental results that the developed CAD system by this method for lung cancer detection and classification from PET/CT images using SVM classifier with RBF kernel, $\sigma = 1$ achieved enriched accuracy of 98.13%.

### CONCLUSION

CAD system was developed with texture and fractal descriptors from fuzzy enhanced PET/CT images for lung cancer diagnosis and classification. Fuzzy image enhancement offered improved contrast for regions of high textures and found useful in lung cancer detection. Texture features based on statistical approach and fractal analysis were found highly useful for detecting and classifying distinct and subtle textures in dual-modality medical images. Significant features were selected from the extracted feature set based upon their relevance and contribution in lung cancer detection. This method identified 3 texture features namely auto correlation, sum average and sum variance and 10 fractal features as significant to detect and classify lung cancer from PET/CT images.

The dataset obtained with these features were linearly non-separable. The RBF kernel in SVM classifier well handled the linearly non-separable features to make them into linearly separable.

Results of this study reveal that SVM classifier is robust with strong generalization ability for moderate data using combined texture and fractal features. SVM with RBF kernel, width $\sigma = 1$ yielded an accuracy of 98.13%. Thus, concluding that SVM is the robust classifier for lung cancer diagnosis and classification from PET/CT images.

**Ethical Clearance:** Taken from Hindustan Institute of Technology and Science, and KCG College of Technology.
Source of Funding: Self

Conflict of Interest: Authors have no conflict of interest to declare regarding the publication of this paper.

REFERENCES


A Study on Relationship among Employees on Grievance Redressal System, Morale Followed in Pharma Companies

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¹Associate Professor, ²Assistant Professor, AMET Business school, Academy of Maritime Education and Training (Deemed to be University), Chennai

ABSTRACT

In an organization where individuals and group work together to meet a common objective, differences of opinion might occur. Grievance is rust on human relations. The cost of a grievance are always high such as loss of time, poor work, damaging the machines, employee anger, poor customer service, resistance to change, union management conflict and so on. The high morale of employees will give positive effects to the companies and the employee will not move on to the different company. It is reported that employees most likely to remain in their works and become stable employees when they have high- esteem and a strong sense self-efficacy.

Keywords: Discipline, Redressal system, Performance & supervisors.

INTRODUCTION AND REVIEWS

Employees’ grievances are associated with the contract signed, rules or regulations, procedure, health and safety measures previous system followed cultural system, employee discrimination, wage/salary, incentive/bonus, etc. The attitude of the management to find the problems of employees and solve it immediately helps to achieve the probability and also to maintain the culture of high performance [2]. Employees must aware on the grievance process in the Pharma companies and their impact on maintaining a good relation with higher authorities. Successful grievance handling mechanism creates a good employee relations and dynamic workplace. Supervisor should give more importance to grievance mechanism than collect all the facts about the grievance and do investigation and give answer [45]. The influence of the supervisors in studying problems in grievance. It is also mentioned that rules should be framed in such a way so that supervisors are directed by their predominant problems [3]. supervisors must have competence and willingness to discuss the difficulty with the employee and union representative at initial stage also supervisory elegance affects grievance rate and their disposition [1].

(1) Pay structure and benefits were not fully given to the employees working in civil constructions, in most of the places employees were used as bonded labour. Some of research articles predicted that pay structure was not good enough to run their day to day life; skills and experience were not considered by the company while fixing the pay structure. Profit making organizations increasing the pay for their employees and has a close attention to the validity of their recruitment practices and are vigilant on developing their employees in order to ensure their achievement both in the present and the future [8]. Employee attrition helps the organization to study the employee’s perception towards the company and the factors that make the employees to feel satisfied and dissatisfied and to take suitable measures to decrease the attrition and retain the employees by satisfying by giving good compensation plan and reward [6].

OBJECTIVES

To check the grievance redressal system followed.

To find the significant impact of employee discipline on morale

To find the mean values of loan issued by the company

To analyze the impact of food provided by the companies.
RESEARCH METHODOLOGY

Secondary data: Journals, research papers and websites

Research design: The research is descriptive in nature

Participants: The participants in the survey were 120.

Sampling techniques: Convenience sampling

Data Collection: Primary data collected from 120 respondents using questionnaire

LIMITATION OF THE STUDY

1. Time & cost constraints
2. Personal bias
3. Cannot be generalized
4. Employees reluctant to provide data

RESULTS AND DISCUSSION

Table 1: ANOVA

$H_0$ – There is no significant difference between these mean values of the grievance redressal system

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2.037</td>
<td>4</td>
<td>.509</td>
<td>2.411</td>
<td>.053</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24.288</td>
<td>115</td>
<td>.211</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 1, $P = .053$ that is $P > .05$. Since $P$ value (.053) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of the grievance redressal system.

Table 2: ANOVA

$H_0$ – There is no significant difference between these mean values of employee discipline and morale level

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.063</td>
<td>4</td>
<td>.266</td>
<td>1.210</td>
<td>.310</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.262</td>
<td>115</td>
<td>.220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 2 $P = .310$ that is $P > .05$. Since $P$ value (.310) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of employee discipline and morale level.

Table 3: ANOVA

$H_0$ – There is no significant difference between these mean values of home loan issued by PHARMA COMPANIES

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.734</td>
<td>4</td>
<td>.434</td>
<td>2.028</td>
<td>.095</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24.591</td>
<td>115</td>
<td>.214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 3, $P = .095$ that is $P > .05$. Since $P$ value (.095) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of home loan issued by PHARMA COMPANIES.
Table 4: ANOVA

$H_0$—There is no significant difference between these mean values of quality of food provided by PHARMA COMPANIES

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.556</td>
<td>4</td>
<td>.389</td>
<td>1.806</td>
<td>.132</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24.769</td>
<td>115</td>
<td>.215</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table 4, $P = .132$ that is $P > .05$. Since $P$ value (.132) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of home loan issued by PHARMA COMPANIES.

CONCLUSION

Grievance arises because of the dissatisfaction among employees; it also arises because of non-motivation of employees. In short if the grievances are not solved immediately it will become a serious issue. An organization must put their efforts to increase the motivation level of employees and employee’s morale. An organization should follow various motivational theories to know its employees motivational level and then put efforts accordingly to achieve the productivity of the company.

Ethical Clearance: Taken from AMET (Deemed to be University), Chennai

Source of Funding: Self

Conflict of Interest: Nil

REFERENCES


Impact of Salary and Reward on the Achievement in the Pharma Companies

S. Poongavanam¹, Srinivasan², R. Divyaranjini²
¹Associate Professor, ²Assistant Professor, AMET Business school, Academy of Maritime Education and Training (Deemed to be University), Chennai

ABSTRACT

Compensation is given to award the employees for their efforts put in the company and to give guarantee that employees will stay in the same company and are satisfied over a longer period of time. It is important as it is a systematic way to plan the compensation for the employees. The selected sampling design is convenience sampling and the sample size is 120. Monetary and Non monetary benefits given to the employees improve the involvement of the employees in the companies.

Keywords: Salary, Reward, Incentives & Promotion

INTRODUCTION AND REVIEW

Determining the right balance between the base pay and commission is the major challenge as a well-designed compensation plan helps create a work culture of high performance which ensures personal as well as organizational growth in tandem. Recognizing and rewarding the performance of individuals based on compensation and benefits creates an attractive environment for pulling and retaining top talent among the industry. The compensation plan should be clear and distributed to the employee force in order to keep them motivated and goal oriented. The proper utilization of the plan lies in the hand of the line managers and the organizational hierarchies to get the best out of the sales force².

¹Base/Basic pay also known as membership based reward, refers to the amount of pay that constitutes the rate for the job, it may be varied according to the grade of the job or for manual workers, the level of skill required. Several factors influence the base pay; these include legal (government regulations), union (staff labour relations), company policy (company strategic aims) and equity (internal and external/market comparisons) ³, ⁴ differentiates between salary and wage by defining salary as income paid to an individual on the basis of performance or position held while wages refers to hourly compensation paid to operating employees on the basis of time worked. It is however important that base pay helps achieve the internal and external equity to avoid de-motivation ⁵ and emphasis this point by pointing out that money can increase performance but this is often limited to short term increase. Team or group incentives plans are plans in which production standard is set for a specific work group and its members are paid incentives if the group exceeds the standard ³.

⁶Pay structure and benefits were not fully given to the employees working in civil constructions, in most of the places employees were used as bonded labour. Some of research articles predicted that pay structure was not good enough to run their day to day life; skills and experience were not considered by the company while fixing the pay structure. Profit making organizations increasing the pay for their employees and has a close attention to the validity of their recruitment practices and are vigilant on developing their employees in order to ensure their achievement both in the present and the future ⁸. Employee attrition helps the organization to study the employee’s perception towards the company and the factors that make the employees to feel satisfied and dissatisfied and to take suitable measures to decrease the attrition and retain the employees by satisfying by giving good compensation plan and reward ⁶.

OBJECTIVES

To study the impact of salary provided in company on the achievement.

To find the significant impact of incentives provided in the company

To find the significant impact of mean values of reward given in the company
RESEARCH METHODOLOGY

Research design: The research is descriptive in nature

Participants: The participants in the survey were 120.

Sampling techniques: Convenience sampling

Data Collection: Primary data collected from 120 respondents using questionnaire

Secondary data: Journals, research papers and websites

LIMITATION OF THE STUDY

1. Time & cost constraints
2. Personal bias
3. Cannot be generalized
4. Employees reluctant to provide data

RESULTS AND DISCUSSION

Table 1: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.500</td>
<td>4</td>
<td>.125</td>
<td>.556</td>
<td>.695</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.825</td>
<td>115</td>
<td>.225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation:

$H_0$ – There is no significant difference between these mean values of salary provided by PHARMACEUTICAL COMPANIES.

$H_1$ – There is significant difference between these mean values of salary provided by PHARMACEUTICAL COMPANIES.

Result: From Table 1 we obtain, $P = .695$ that is $P > 0.05$. Since $P$ value (.695) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of salary provided by PHARMACEUTICAL COMPANIES.

Table 2: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.507</td>
<td>4</td>
<td>.127</td>
<td>.564</td>
<td>.689</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.818</td>
<td>115</td>
<td>.225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation:

$H_0$ – There is no significant difference between these mean values of an incentive provided by PHARMACEUTICAL COMPANIES.

$H_1$ – There is significant difference between these mean values of an incentive provided by PHARMACEUTICAL COMPANIES.

Result: As per Table 2, $P = .689$ that is $P > 0.05$. Since $P$ value (.689) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of an incentive provided by PHARMACEUTICAL COMPANIES.

Table 3: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.534</td>
<td>4</td>
<td>.384</td>
<td>1.779</td>
<td>.138</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24.791</td>
<td>115</td>
<td>.216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interpretation:

$H_0$ – There is no significant difference between these mean values of rewards provided by PHARMACEUTICAL COMPANIES.

$H_1$ – There is significant difference between these mean values of rewards provided by PHARMACEUTICAL COMPANIES.

Result: As per Table 3, $P = .138$ that is $P > .05$. Since $P$ value (.138) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of rewards provided by PHARMACEUTICAL COMPANIES.

<table>
<thead>
<tr>
<th>Table 4: Crosstab Promotion and Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

The above Table 4 shows that 10 employees were very unhappy with the promotion and transfer, 11 employees are unhappy with the promotion with transfer, 16 employees were partially happy, 49 employees were happy and last 34 employees were very happy with the promotion with transfer.

CONCLUSION

The compensation plan provided in the company will make the employees to work effectively and efficiently. So every organization needs a good compensation plan which suits their employees to motivate and created involvement among employees. Only a Good compensation plan will improve the satisfaction level of the employees

Ethical Clearance: Taken from AMET (Deemed to be University), Chennai

Source of Funding: Self

Conflict of Interest: Nil

REFERENCES


ABSTRACT

The significance of the seniors-subordinate rapport and the role of communication system in business are discussed in this study. The paper also highlights the workplace temperature, wetness and air flow in the company and the way it kindle a good relationship between workers, senior and subordinate. The study found that there is no significant difference between these mean values of workplace temperature, humidity and air circulations. The employees indicated that there is significant difference between the communications systems followed. The study concludes that there is no significant relationship between the peer groups and senior and subordinates.

Keywords: Peer, Subordinates, Communication & Relationship.

INTRODUCTION AND REVIEWS

Pharma companies wants to reach an excellence in the working environment by studying the problems of employees and the communication system followed in the business processes.. To survive and grow in the twenty-first century, entrepreneurs must learn and use appropriate human skills to motivate and inspire all those involved in their business[1,2]. Few studies had recommended that without well-built associations, company cannot achieve the aim[3,4]. It was suggest that it the relationship can be managed well [5,6,7]. It was concludes that relationships is not that just like any other relationship; but it needs lot of attempts to sustain the relationship and it will be beneficial to the company and all person involved[8,9]. Pay structure and benefits were not fully given to the employees working in civil constructions, in most of the places employees were used as bonded labour. Some of research articles predicted that pay structure was not good enough to run their day to day life; skills and experience were not considered by the company while fixing the pay structure. Profit making organizations increasing the pay for their employees and has a close attention to the validity of their recruitment practices and are vigilant on developing their employees in order to ensure their achievement both in the present and the future [10]. Employee attrition helps the organization to study the employee’s perception towards the company and the factors that make the employees to feel satisfied and dissatisfied and to take suitable measures to decrease the attrition and retain the employees by satisfying by giving good compensation plan and reward [9].

OBJECTIVES

To check the significance difference between workplace temperature, humidity and air circulation
To find the significant impact in the communication system followed
To find the relationship between peers
To analyze the relationship between seniors and subordinates.

RESEARCH METHODOLOGY

Research design: The research is descriptive in nature
Participants: The participants in the survey were 120.
Sampling techniques: Convenience sampling
Data Collection: Primary data collected from 120 respondents using questionnaire
Secondary data: Journals, research papers and websites

LIMITATION OF THE STUDY

1. Time & cost constraints
2. Personal bias
3. Cannot be generalized
4. Employees reluctant to provide data
RESULTS AND DISCUSSION

Table 1: ANOVA

\( H_0 \)–There is no significant difference between these mean values of workplace temperature, humidity and air circulations

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.271</td>
<td>4</td>
<td>.068</td>
<td>.299</td>
<td>.878</td>
</tr>
<tr>
<td>Within Groups</td>
<td>26.054</td>
<td>115</td>
<td>.227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 1, \( P = .878 \) that is \( P > .05 \). Since \( P \) value (.878) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of workplace temperature, humidity and air circulations.

Table 2: ANOVA

\( H_0 \)–There is no significant difference between these mean values of the communication system at PHARMA COMPANIES

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.390</td>
<td>3</td>
<td>.130</td>
<td>.581</td>
<td>.629</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.935</td>
<td>116</td>
<td>.224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 2, \( P = .629 \) that is \( P > .05 \). Since \( P \) value (.629) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of the communication system at PHARMA COMPANIES.

Table 3: ANOVA

\( H_0 \)–There is no significant difference between these mean values of relationships among peers

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2.741</td>
<td>4</td>
<td>.685</td>
<td>3.341</td>
<td>.013</td>
</tr>
<tr>
<td>Within Groups</td>
<td>23.584</td>
<td>115</td>
<td>.205</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 3, \( P = .013 \) that is \( P > .05 \). Since \( P \) value (.013) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of relationships among peers.

Table 4: ANOVA

\( H_0 \)–There is no significant difference between these mean values of relationship between senior & subordinates

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.765</td>
<td>4</td>
<td>.191</td>
<td>.860</td>
<td>.490</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.560</td>
<td>115</td>
<td>.222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 4, \( P = .490 \) that is \( P > .05 \). Since \( P \) value (.490) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of relationship between senior & subordinates.
CONCLUSION

The main aim of the managers is to create positive/cordial relations between employees and with their higher authorities. It is evident from the various research work positive relationship increases the profitability and market share of the company. It is evident the word cordial relationship is the key towards achievements. It also helps the employees and management to face the challenging and difficulties. Employees are motivated to maintain/improve their cordial relationship in the company.

Ethical Clearance: Taken from AMET (Deemed to be University), Chennai

Source of Funding: Self

Conflict of Interest: Nil

REFERENCES


A Study on Relationship among the Information System and Pay Scale System Followed in Pharma Companies

S. Poongavanam¹, Srinivasan², R. Divyaranjini²
¹Associate Professor, ²Assistant Professor, AMET Business school, Academy of Maritime Education and Training (Deemed to be University), Chennai

ABSTRACT

Information system followed in the pharma companies will be very helpful to create a good relationship. This article analyses the pay scale fixed in Pharma companies and the skill needed for promotion. The researchers bring into light the HRIS and theoretical work of few researcher. This article gives importance on the need of this study in the current business scenario. Due to the time and cost factor involved in researcher studies only a few information. The selected research methodology is convenience sampling with the sample size of 120.

Keywords: Information systems, Human Resource, pay & promotion

INTRODUCTION AND REVIEW

Human Resource Management (HRM) can be defined as policies and practices involved in carrying out human resource aspect of management [1], that influence employees’ behaviour, attitudes and performance [2]. Organizations that realize the importance of Human Resources as an asset rather than as a commodity would always find ways to create a working environment that is conducive, safe, and able to fulfill work life balance to their employees in the recent years. The Leave Module offers comprehensive management of all types of leave time, including sick time, medical leave; scheduled days off; current vacation balances and vacation accrual; leave requests and leave approvals. By handling leave management electronically, an organization can streamline the leave request process, eliminate paperwork and improve direct communication between the employee and employer. [3] Is the HRM department implementing any change in their focus to help the company reach its critical success points? [4] Considering the HRM perspectives and evaluation models, 4 major ones have been developed in HRM literature [5] from its origins in the late 1970s. HRM focus is perceived as flexible, adapting to ongoing change and anticipating demands forecasted in future scenarios, in as much as the HRM functions support the business [6]. Changing conditions and situations have required the requirement for the best possible dispersal of data at different levels of administration. The advancement and utilization of data administration frameworks (MIS) is a cutting edge wonder worried about the utilization of proper data that will prompt better arranging, better basic leadership and better outcomes [7]. A coordinated framework with abilities like knowledge, forecast and reinforce capacities can give considerable included an incentive to leaders both strategic and arrangement making levels [8].

Pay structure and benefits were not fully given to the employees working in civil constructions, in most of the places employees were used as bonded labour. Some of research articles predicted that pay structure was not good enough to run their day to day life; skills and experience were not considered by the company while fixing the pay structure. Profit making organizations increasing the pay for their employees and has a close attention to the validity of their recruitment practices and are vigilant on developing their employees in order to ensure their achievement both in the present and the future [8]. Employee attrition helps the organization to study the employee’s perception towards the company and the factors that make the employees to feel satisfied and dissatisfied and to take suitable measures to decrease the attrition and retain the employees by satisfying by giving good compensation plan and reward [9].

OBJECTIVES

To study the impact of human resource information system followed in the company.
To find the significant impact of newly designed HRIS as per the company plan

To find the mean values of HR information system

To analyze the impact of pay scale and promotion.

**RESEARCH METHODOLOGY**

**Research design:** The research is descriptive in nature

**Participants:** The participants in the survey were 120.

**Sampling techniques:** Convenience sampling

**DATA COLLECTION**

Primary data collected from 120 respondents using questionnaire

Secondary data: Journals, research papers and websites

**LIMITATION OF THE STUDY**

1. Time & cost constraints
2. Personal bias
3. Cannot be generalized
4. Employees reluctant to provide data

**RESULTS AND DISCUSSION**

Table 1: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.708</td>
<td>4</td>
<td>.427</td>
<td>1.995</td>
<td>.100</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24.617</td>
<td>115</td>
<td>.214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 1, P = .065 that is P > .05. Since P value (.065) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of up-date of human resource information system.

Table 2: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.702</td>
<td>4</td>
<td>.176</td>
<td>.788</td>
<td>.535</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.623</td>
<td>115</td>
<td>.223</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per Table 2, P = .535 that is P > .05. Since P value (.535) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of HRIS designing perfectly to meet PHARMA COMPANIES’s requirements.

Table 3: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.752</td>
<td>3</td>
<td>.251</td>
<td>1.138</td>
<td>.337</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.573</td>
<td>116</td>
<td>.220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As per Table 3, \( P = 0.337 \) that is \( P > 0.05 \). Since \( P \) value (.337) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of HR information system at PHARMA COMPANIES.

### Table 4: ANOVA

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>( F )</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.299</td>
<td>4</td>
<td>.325</td>
<td>1.493</td>
<td>.209</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.026</td>
<td>115</td>
<td>.218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.325</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interpretation:

\( H_0 \) – There is no significant difference between these mean values of increases pay scale without promotion.

\( H_1 \) - There is significant difference between these mean values of increases pay scale without promotion.

From Table 4 we obtain, \( P = 0.209 \) that is \( P > 0.05 \). Since \( P \) value (.209) is greater than the .05 at 5% level of significance. Null hypothesis is accepted. Therefore there is no significant difference between these mean values of pay scale increases without promotion.

### CONCLUSION

The management of the company must realize the impact of Human Resources information system adopted in pharma companies. It is treated as an asset rather than as a commodity, it will surely improve the working environment which will be helpful for the safe running of the company and effective work life balance for their employees. The information system provides information about the department, procedure, employees so on for the decision making purposes.

### Ethical Clearance:

Taken from AMET (Deemed to be University), Chennai

### Source of Funding:

Self

### Conflict of Interest:

Nil

### REFERENCES


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